ORDER NO. HAD85052539C0
A2

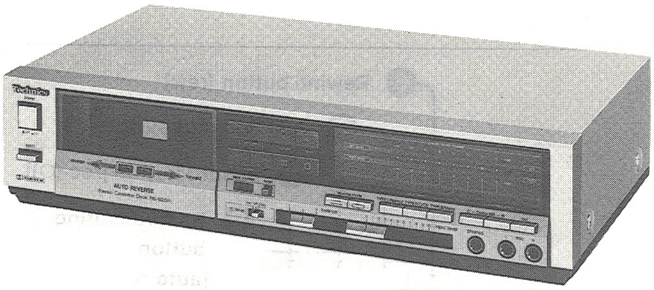
Service Manual

Cassette Deck

RS-B28R
RS-928R

Dolby B-C NR, Auto-Reverse
Cassette Deck

*
DOLBY B-C NR



Color

(K)...Black Type
(S)...Silver Type

Color	Areas	
(S)	[M] .......U.S.A.	(RS-B28R)
(S)	[MC].....Canada.	(RS-B28R)
(K)	[M] .......U.S.A.	(RS-928R)
(K)	[MC].....Canada.	(RS-928R)
(K) (S)	[E]........All European areas except United Kingdom.	(RS-B28R)
(K) (S)	[EK] .....United Kingdom.	(RS-B28R)
(K) (S)	[EGA]...F.R. Germany.	(RS-B28R)
(K) (S)	[EH] .....Holland.	(RS-B28R)
(K) (S)	[XA] .....Asia, Latin America, Middle East and Africa.	(RS-B28R)
(K) (S)	[XL] .....Australia.	(RS-B28R)

- The function and operating method of RS-928R are the same as for RS-B28R.

RS-B49R MECHANISM SERIES

SPECIFICATIONS

Deck system:	Stereo cassette deck
Track system:	4-track, 2-channel
Heads: (Combination)	
REC/PLAY;	MX head
Erasing;	Double-gap ferrite head
Motor:	1 motor system
Recording system:	AC bias
Bias frequency;	80 kHz
Erasing system:	AC bias
Tape speed:	4.8 cm/sec. (1⅞ ips.)
Frequency response:	
Metal;	20 Hz~17,000 Hz 30 Hz~17,000 Hz (DIN) 40 Hz~16,000 Hz±3 dB
CrO$_2$;	20 Hz~17,000 Hz 30 Hz~16,000 Hz (DIN) 40 Hz~15,000 Hz±3 dB
Normal:	20 Hz~16,000 Hz 30 Hz~15,000 Hz (DIN) 40 Hz~14,000 Hz±3 dB
S/N: (signal level=max. recording level, CrO$_2$ type tape)	
Dolby C NR in;	75 dB (CCIR)
Dolby B NR in;	67 dB (CCIR)
NR out;	57 dB (A weighted)

Wow and flutter:	0.08% (WRMS) ±0.14% (DIN)
Fast Forward and Rewind time:	Approx. 90 seconds with C-60 cassette tape
Input sensitivity and impedance:	
MIC;	0.25 mV/400Ω~10 kΩ
LINE;	60 mV/47 kΩ
Output voltage and impedance:	
LINE;	400 mV/1.5 kΩ
HEADPHONES;	80 mV/8Ω
Power consumption:	18 W
Power supply: [M][MC]	AC 60 Hz 120 V
[E][EH][EGA]	AC 50/60 Hz 220 V
[EK][XA][XL]	AC 50/60 Hz 110 V/127 V/220 V/240 V Preset Power Voltage 240 V
Dimensions (W×H×D)	430×100.5×229.5 mm (16$^{15}/_{16}$"×3$^{31}/_{32}$"×9$^{1}/_{32}$")
Weight:	3.6 kg (7 lbs. 15 oz.)

Design and specifications are subject to change without notice.

*'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Technics

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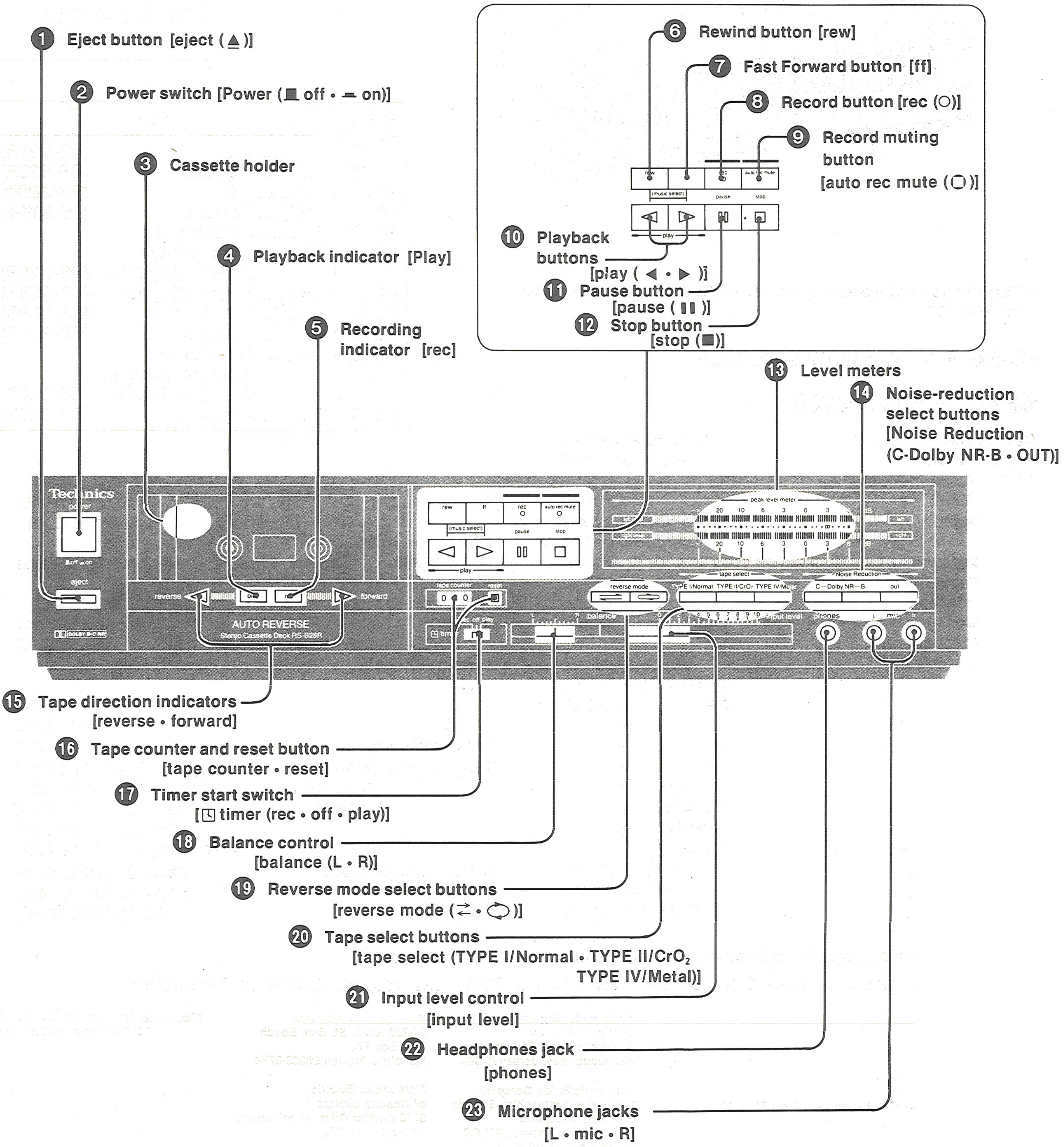
■ LOCATION OF CONTROL


Technics
power
off on
eject
reverse
forward
AUTO REVERSE
Stereo Cassette Deck RS-B28R
rew
ff
rec
auto rec mute
(music select)
pause
stop
play
tape counter
reset
timer
rec off play
balance
L
R
reverse mode
tape select
TYPE I/Normal
TYPE II/CrO₂
TYPE IV/Metal
input level
peak level meter
Noise Reduction
C—Dolby NR—B
out
phones
mic
DOLBY B-C NR

① Eject button [eject (▲)]

② Power switch [Power (▀ off • ▂ on)]

③ Cassette holder

④ Playback indicator [Play]

⑤ Recording indicator [rec]

⑥ Rewind button [rew]

⑦ Fast Forward button [ff]

⑧ Record button [rec (○)]

⑨ Record muting button [auto rec mute (○)]

⑩ Playback buttons [play (◀ • ▶)]

⑪ Pause button [pause (▮▮)]

⑫ Stop button [stop (■)]

⑬ Level meters

⑭ Noise-reduction select buttons [Noise Reduction (C-Dolby NR-B • OUT)]

⑮ Tape direction indicators [reverse • forward]

⑯ Tape counter and reset button [tape counter • reset]

⑰ Timer start switch [◷ timer (rec • off • play)]

⑱ Balance control [balance (L • R)]

⑲ Reverse mode select buttons [reverse mode (⇄ • ⟳)]

⑳ Tape select buttons [tape select (TYPE I/Normal • TYPE II/CrO_2 TYPE IV/Metal)]

㉑ Input level control [input level]

㉒ Headphones jack [phones]

㉓ Microphone jacks [L • mic • R]

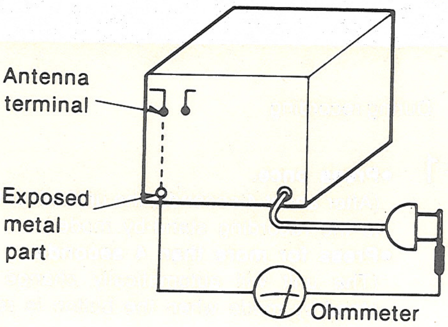
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.).

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

● INSULATION RESISTANCE TEST

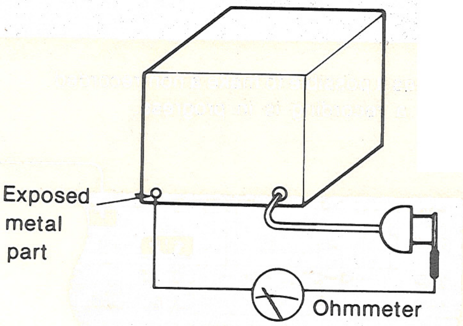
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

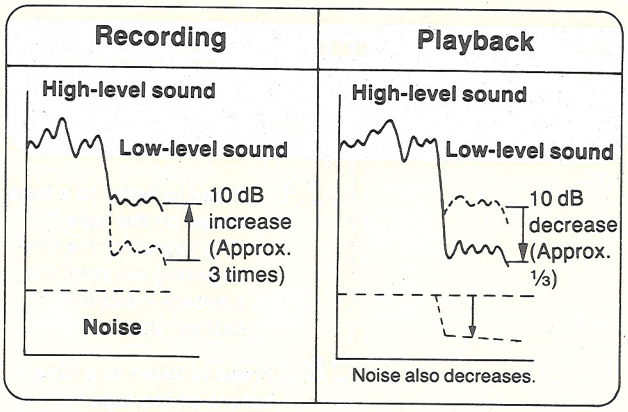
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ OPERATION

Noise-reduction systems (Dolby NR B type and C type)

Noise-reduction systems can be used to reduce tape "hiss" noise, which is a natural characteristic of tape, to an acceptable low level.

- Because the level of tape noise is a fixed level, such noise is more easily heard as the level of the music signals becomes lower. Thus, when a recording is made, low levels are recorded at a high level, and, when this recording is played back, it is played back, conversely, at a low level.
  Because the tape noise will also be then played back at a low level, the result is a reduction in the noise level.
- The B type Dolby noise-reduction performs this function in the high-frequency range, and the C type functions for the high and the middle-frequency range.



Dolby noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Automatic-reverse system

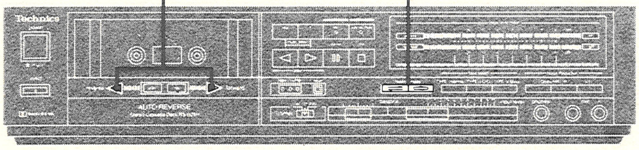
This is a function which makes it possible to automatically change the direction of recording or playback without ejecting the cassette and then re-inserting it.

Tape direction indicators
- forward... front side (the side of the cassette which can be seen through the cassette holder).
- reverse... reverse side.

Reverse mode select buttons

⇄ ...One-way mode

⟲ ...Continuous mode



This feature is convenient in the following ways:

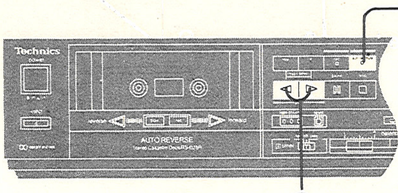
During playback
- When the reverse mode is set for continuous (⟲) operation, the tape automatically changes the direction of movement when it reaches its end. For this unit, 8 complete plays (forward and reverse), or in other words 15 automatic-reverse operations, are possible.
- Even if the reverse mode is set for one-way (⇄) operation, the direction of tape movement can be changed, without ejecting the cassette, by pressing the playback button for the opposite direction.

During recording
- Continuous recording from the "front" side of the tape to the "reverse" side is possible when the reverse mode is set for continuous (⟲) operation.

Record-muting

This is a feature which makes it possible to make a non-recorded portion on the tape while a recording is in progress.

During recording



1
- **Press once.**
  (After about 4 seconds, the unit will automatically change to the recording stand-by mode.)
- **Press for more than 4 seconds.**
  (The unit will automatically change to the recording stand-by mode when the button is released.)

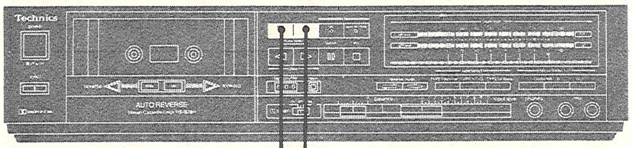
2 **To resume the recording, press the button corresponding to the direction of recording you want to select.**

Tune selection

This feature is used to find the beginning of a tune, either before or after the present position of the tape.

■ Operation

1 **Press the playback button corresponding to the direction of playback you want to select.**



2A **Press to listen to a tune ahead on the tape.**
(The search for the tune beginning will start; the playback indicator flashes rapidly.)

2B **Press to listen to a tune before on the tape.**
(The search for the tune beginning will start; the playback indicator flashes rapidly.)

To find a tune which is a few tunes ahead (or before) on the tape, repeat step *2* as needed.

Note:

The tune-select system will not function correctly under the following conditions:
- If the blank portion between tunes is less than 4 seconds.
- If there is excessive noise between tunes.
- If there is a very low-sound level place, or an unrecorded space, during a tune.
- If the tape has been recorded by using fade-in and/or fade-out* techniques.

***Fade-in and Fade-out**
Fade-in is a recording technique to gradually increase the sound (from 0 to the ordinary level) at the beginning of a recording. Fade-out is to gradually decrease the sound (from the ordinary level to 0) at the end of a recording.

Music select system manufactured under license of Starr. S.A., Bruxelles, Belguim.

DISASSEMBLY INSTRUCTION

Ref. No. 1	How to remove the case cover
Procedure 1	• Remove the 4 setscrews (①~④).

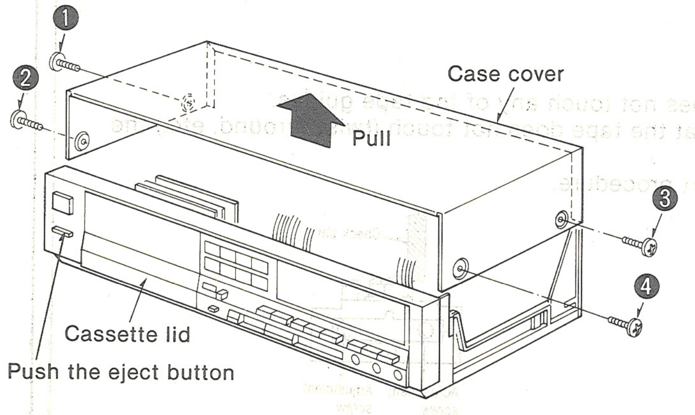

①
②
Case cover
Pull
③
④
Cassette lid
Push the eject button

Fig. 1

Ref. No. 2	How to remove the main P.C.B.
Procedure 1 → 2	• Remove the setscrew (①), and then remove the AC socket angle. • Push the 4 tabs aside, and then pull down the back chassis. • Remove the 2 setscrews (④, ⑤) and than remove the erase plate. • Remove the 2 setscrews (②, ③). • Remove Main P.C.B. in the direction of arrow Ⓐ.

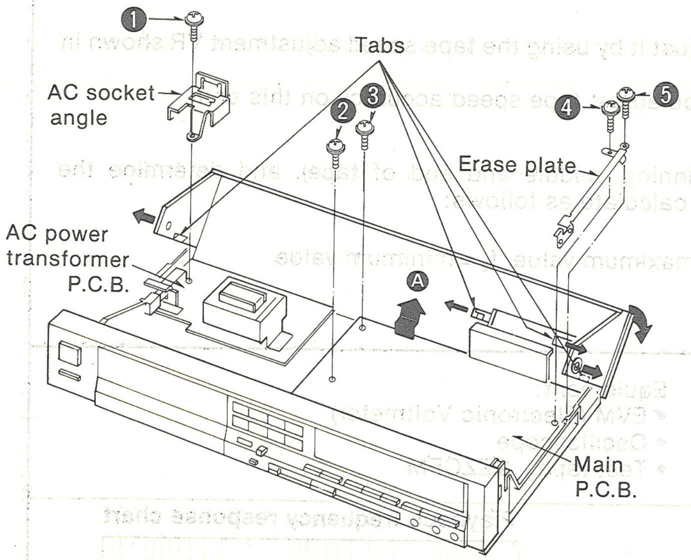

①
Tabs
AC socket angle
②
③
④
⑤
Erase plate
AC power transformer P.C.B.
Ⓐ
Main P.C.B.

Fig. 2

Ref. No. 3	How to remove the meter P.C.B.
Procedure 1 → 3	• Remove the 5 setscrews (①~⑤), and then remove the shield angle. • Push the 2 tabs aside.

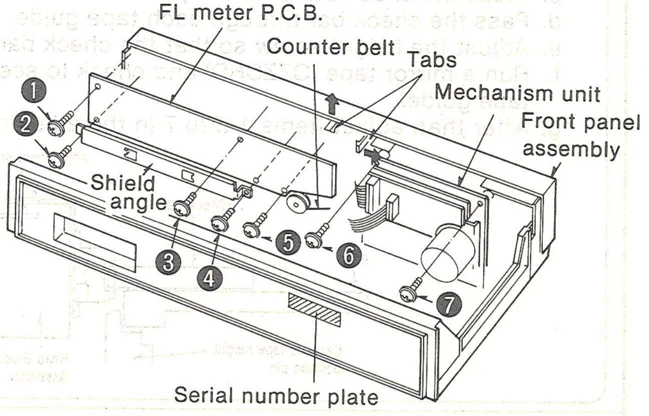

FL meter P.C.B.
Counter belt
Tabs
Mechanism unit
Front panel assembly
①
②
Shield angle
③
④
⑤
⑥
⑦
Serial number plate

Fig. 3

Ref. No. 4	How to remove the mechanism unit
Procedure 1 → 4	• Push the eject button (see fig. 1). • Remove the 2 setscrews (⑥, ⑦) (see fig. 3). • Remove the 3 setscrews. (③~⑤)

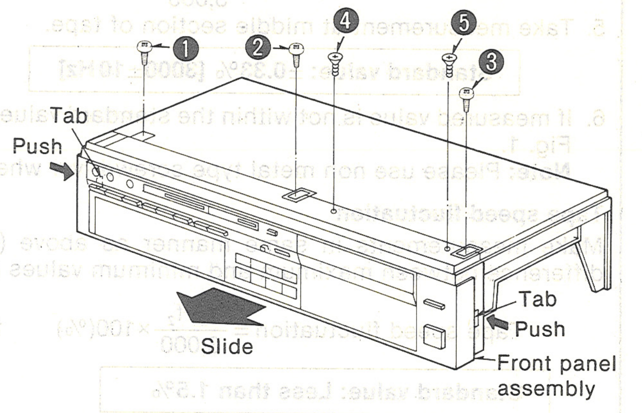
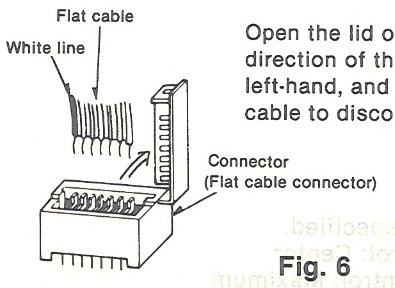

①
②
④
⑤
③
Tab
Push
Slide
Tab
Push
Front panel assembly

Fig. 4

Ref. No. 5	How to remove the front panel assembly
Procedure 1 → 5	• Remove the 2 connectors (A, B) and 7 flat cables (ⓑ, ⓕ, ⓖ, ⓗ, ⓘ, ⓧ, ⓨ). • Remove the 3 setscrews (①~③) (see fig. 4). • Push the 2 tabs aside (see fig. 4).

How to remove flat cable


Flat cable
White line
Connector
(Flat cable connector)

Open the lid of connector in the direction of the arrow as shown left-hand, and extract the flat cable to disconnect.

Fig. 6

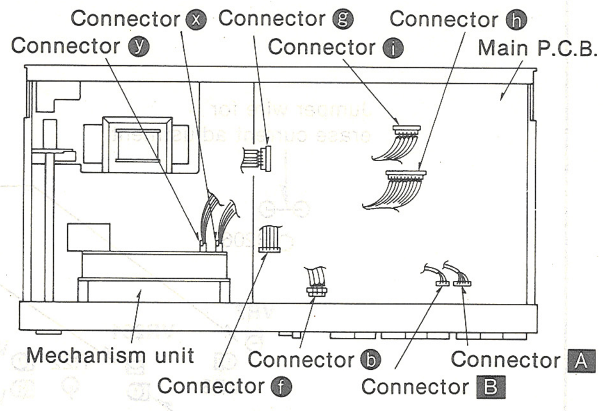

Connector ⓧ
Connector ⓖ
Connector ⓗ
Connector ⓨ
Connector ⓘ
Main P.C.B.
Mechanism unit
Connector ⓑ
Connector A
Connector ⓕ
Connector B

Fig. 5

- **How to remove the head lead connector**

  Pull the connector with pincers alternatively on the right and left sides as shown by the arrows.

- **How to insert the head lead connector**

  Match the projections of the connector with the marks printed on the P.C.B. and then insert the connector completely.

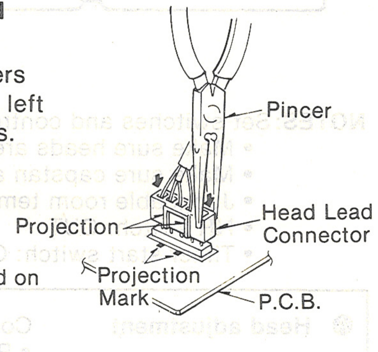

Pincer
Projection
Head Lead Connector
Projection Mark
P.C.B.

Fig. 7

Ref. No. 6	How to remove the LED P.C.B.
Procedure 1 → 6	• Push the eject button. • Remove the cassette lid. • Push the 4 tabs aside.

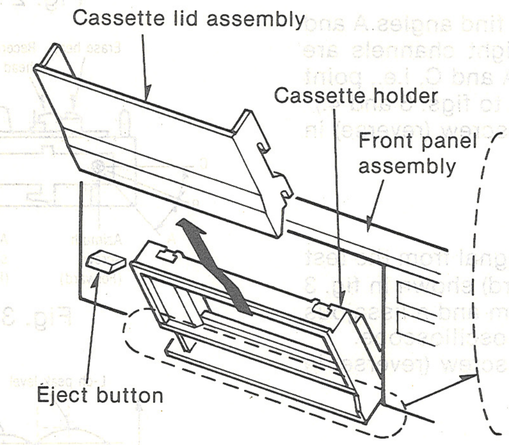

Cassette lid assembly
Cassette holder
Front panel assembly
Eject button

Fig. 8

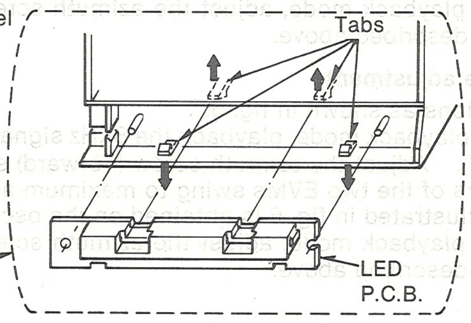

Tabs
LED P.C.B.

Fig. 9

*** Serial No. Indication**

- The serial number plate of this product is attached to the back chassis (shown in fig. 3).

■ MEASUREMENT AND ADJUSTMENT METHODES

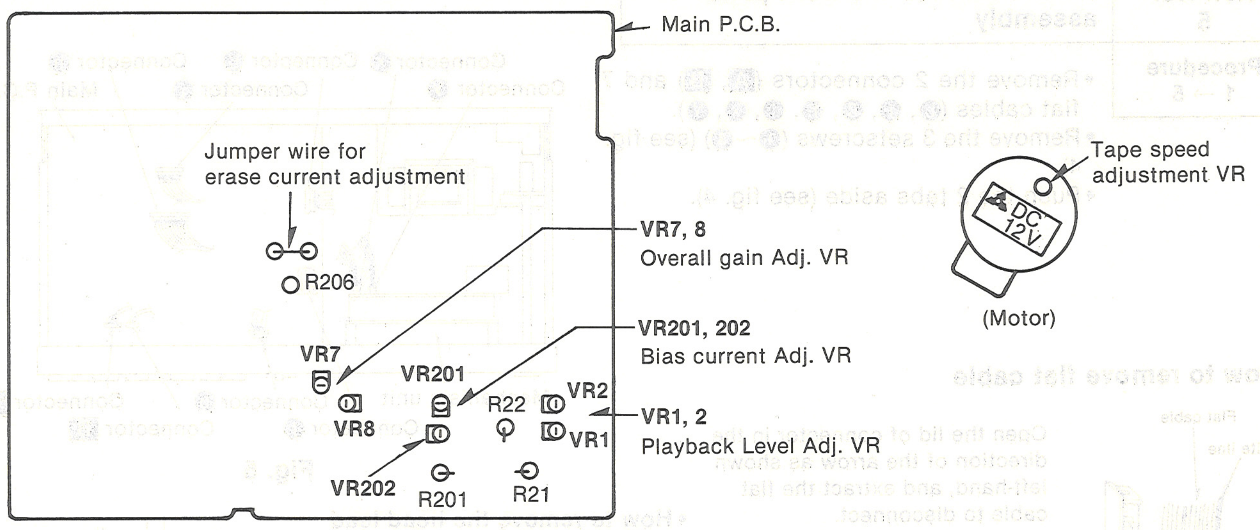

Main P.C.B.
Jumper wire for erase current adjustment
R206
VR7, 8
Overall gain Adj. VR
VR201, 202
Bias current Adj. VR
VR1, 2
Playback Level Adj. VR
VR7
VR8
VR201
VR202
R201
R22
R21
VR2
VR1
Tape speed adjustment VR
DC 12V
(Motor)

Fig. 1

NOTES: Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature 20±5°C (68±9°F)
- NR switch: OUT
- Timer start switch: OFF
- Balance control: Center
- Input level control: Maximum
- Mode switch: ⟲ mode

Ⓐ Head adjustment

Condition:
- Playback mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape (azimuth)...QZZCFM

L-CH/R-CH output balance adjustment

1. Make connections as shown in fig. 2.
2. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM).
   Adjust the azimuth screw (Forward) shown in fig. 3 for maximum output L-CH and R-CH levels.
   When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows.
3. Turn the azimuth screw (Forward) shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 3 and 4.)
4. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

L-CH/R-CH phase adjustment

5. Make connections as shown in fig. 5.
6. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM). Adjust the azimuth screw (Forward) shown in fig. 3 so that pointers of the two EVMs swing to maximum and a lissajous waveform as illustrated in fig. 6 is obtained on the oscilloscope.
7. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

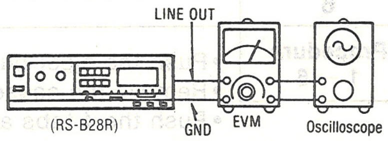

LINE OUT
(RS-B28R)
GND
EVM
Oscilloscope

Fig. 2

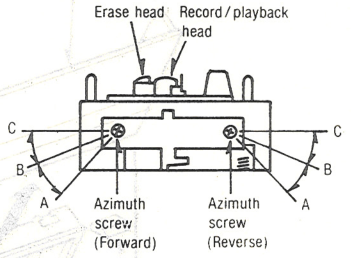

Erase head
Record / playback head
C
B
A
C
B
A
Azimuth screw (Forward)
Azimuth screw (Reverse)

Fig. 3

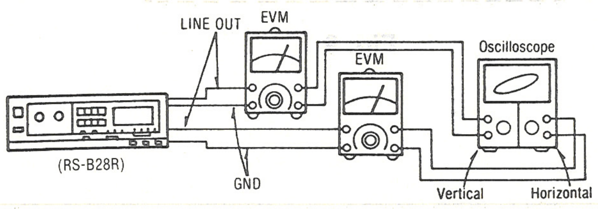

LINE OUT
EVM
EVM
Oscilloscope
(RS-B28R)
GND
Vertical
Horizontal

Fig. 5

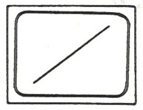


Fig. 6

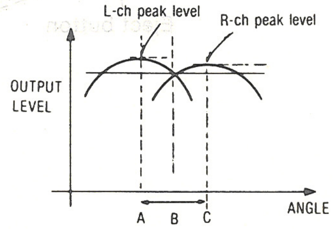


Fig. 4

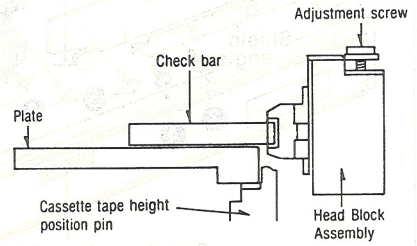
Checking the difference in level between forward and reverse running

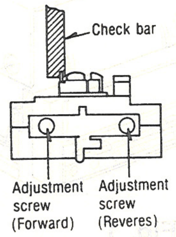
8. Reproduce the playback level adjustment signal (315Hz at 0dB) on the standard playback adjustment tape, and check that the difference between the level in forward running and that in reverse running is within 1.0dB.
9. After adjustment, lock the adjustment screws.

Head Height Adjustment using the Head Adjustment Jig (QZZ0207)

The head adjustment jig (QZZ0207) enables accurate, speedy head height adjustment in the following manner.

a. Place the plate onto the mechanism.
b. Set the mechanism to the PLAY mode.
c. Place the check bar onto the plate.
d. Pass the check bar through each tape guide.
e. Adjust the height screw so that the check bar does not touch any of the tape guides.
f. Run a mirror tape (QZZCRD) and check to see that the tape does not touch (twist arround, etc.) the tape guide.
g. After that, adjust items 1 thru 7 in the adjustment procedure.


Adjustment screw
Check bar
Plate
Cassette tape height position pin
Head Block Assembly


Check bar
Adjustment screw (Forward)
Adjustment screw (Reveres)

Ⓑ Tape speed

Condition:
- Playback mode

Equipment:
- Digital frequency counter
- Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 7.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:

$$\text{Tape speed accuracy} = \frac{f-3{,}000}{3{,}000} \times 100(\%) \qquad \text{where, } f = \text{measured value}$$

5. Take measurement at middle section of tape.

Standard value: ±0.33% [3000±10Hz]

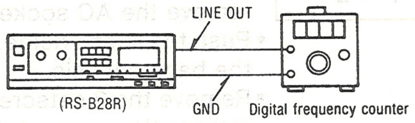

LINE OUT
(RS-B28R)
GND
Digital frequency counter

Fig. 7

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.
   Note: Please use non metal type screwdriver when you adjust tape speed accuracy on this unit.

Tape speed fluctuation

Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:

$$\text{Tape speed fluctuation} = \frac{f_1-f_2}{3{,}000} \times 100(\%) \qquad f_1 = \text{maximum value, } f_2 = \text{minimum value}$$

Standard value: Less than 1.5%

Ⓒ Playback frequency response

Condition:
- Playback mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 8).

Playback frequency response chart

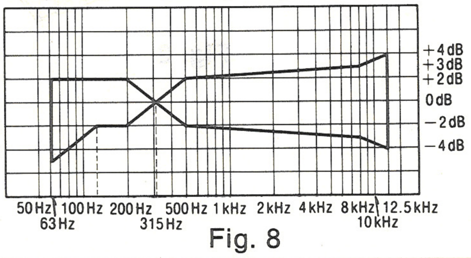


Fig. 8

Ⓓ Playback gain

Condition:
- Playback mode (Forward • Reverse)

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback standard recording level portion on test tape (QZZCFM 315 Hz) and, using EVM, measure the output level at LINE OUTs.
3. Make measurements for both channels.

Standard value: 0.4 V±0.05 V

Adjustment

1. If the measured value is not within the standard, adjust VR1 (L-CH) or VR2 (R-CH) (See fig. 1).
2. After adjustment, check "Playback frequency response" again.

Ⓔ Erase current

Condition:
- Record mode (Forward • Reverse)
- Metal tape mode

Equipment:
- EVM (Electronic Voltmeter)
- Oscilloscope

1. Test equipment connection is shown in fig. 9.
2. Place UNIT into metal tape mode.
3. Press the record and pause buttons.
4. Read voltage on EVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R201}}{1\ (\Omega)}$$

Standard value: 190^{+10}_{-15} mA (Metal) (190^{+10}_{-15} mV)

5. If the measured value is not within the standard value adjust it by following the adjustment instructions.

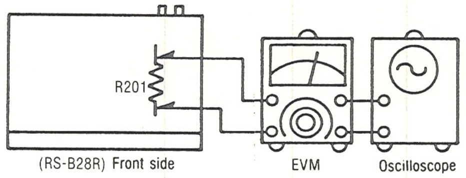


Fig. 9

Adjustment

If the erase current is more than 200 mA, cut the jumper wire (See fig. 1).

Ⓕ Overall frequency response

Condition:
- Record/playback mode
- Normal tape mode
- CrO₂ tape mode
- Metal tape mode
- Input level controls...MAX
- Balance control...Center

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape)
  ...QZZCRA for Normal
  ...QZZCRX for CrO₂
  ...QZZCRZ for Metal

Note:

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 11.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1 kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1 kHz, 50 Hz, 100 Hz, 200 Hz, 500 Hz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 5, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 10). (If the curve is within the charted specifications, proceed to steps 7, 8 and 9.)
   If the curve is not within the charted specifications, adjust as follows;

Overall frequency response chart (Normal)

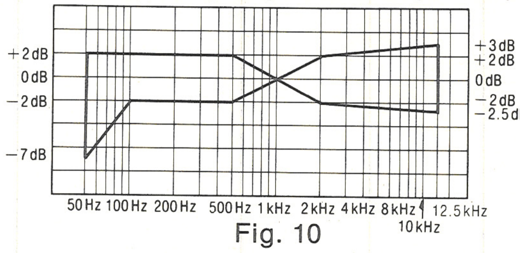


Fig. 10

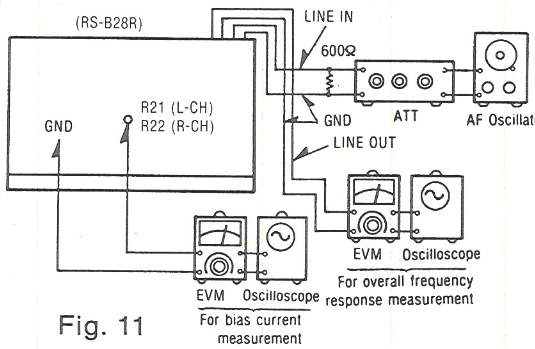


Fig. 11

Adjustment (A):

When the curve exceeds the overall specified frequency response chart (fig. 10) as shown in fig. 12.

1) Increase bias current by turning VR201 (L-CH) and VR202 (R-CH). (See fig. 1)
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 10.)
3) If the curve still exceeds the specifications (fig. 10), increase bias current further and repeat steps 5 and 6.

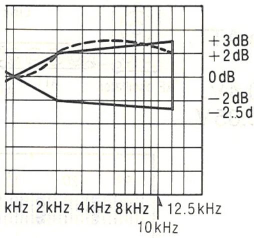


Fig. 12

Adjustment (B):

When the curve falls below the overall specified frequency response chart (fig. 10) as shown in fig. 13.

1) Reduce bias current by turning VR201 (L-CH) and VR202 (R-CH).
2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 10.)
3) If the curve still falls below the charted specifications (fig. 10), reduce bias current further and repeat steps 5 and 6.

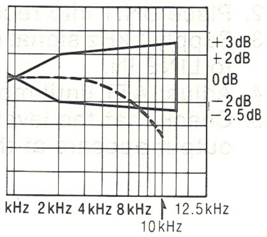


Fig. 13

7. Place UNIT into CrO₂ tape mode.
8. Change test tape to CrO₂ reference blank test tape (QZZCRX), and record 1 kHz, 50 Hz, 100 Hz, 200 Hz, 500 Hz, 4 kHz, 8 kHz, 10 kHz, 12.5 kHz and 14 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO₂ tapes (fig. 14).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1 kHz, 50 Hz, 100 Hz, 200 Hz, 500 Hz, 4 kHz, 8 kHz, 10 kHz, 12.5 kHz and 14 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 14).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.
    - Read the voltage at the terminals of resistor R21 (L-CH) {R22 (L-CH)}, and calculate the bias current from the following formula.

$$\text{Bias current (A)} = \frac{\text{Value read on EVM (V)}}{10\ (\Omega)}$$

Standard value: around 420μA (Normal position)
around 560μA (CrO₂ position)
around 900μA (Metal position)

Overall frequency response chart (CrO₂, Metal)

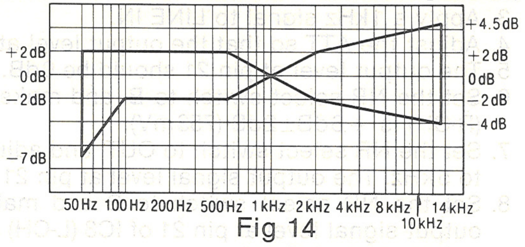


Fig 14

Ⓖ Overall gain

Condition:
- Record/playback mode
- Normal tape mode
- Input level controls
- Standard input level;
  MIC ....−72 dB±4 dB (0.25 mV)
  LINE IN ......−24 dB±4 dB (60 mV)

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape)
  ...QZZCRA for Normal

1. Test equipment connection is shown in fig. 15.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1 kHz signal through ATT (−24 dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.4 V±0.05 V.
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes 0.4 V±0.05 V.
7. If measured value is not 0.4 V±0.05 dB, adjust it by using VR7 (L-CH) or VR8 (R-CH).
8. Repeat from step (2).

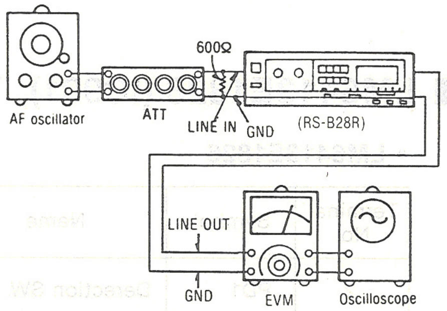


Fig. 15

Ⓗ Level meter

Condition:
- Record mode
- Input level controls...MAX

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- AF oscillator

1. Test equipment connection is shown in fig. 16.
2. Place UNIT into record mode.
3. Supply 1kHz signal (−24dB) from AF oscillator, through ATT to LINE IN.
4. Adjust ATT until monitor level at LINE OUT becomes 0.4V.
5. Check that the level meter LED "0" is lit when 0.4V±0.05V output appears at the LINE OUT.

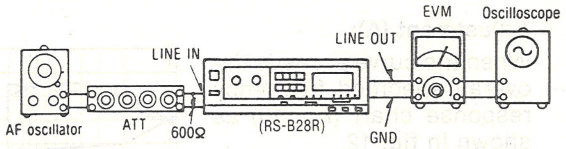

EVM
Oscilloscope
LINE OUT
LINE IN
AF oscillator
ATT
600Ω
(RS-B28R)
GND

Fig. 16

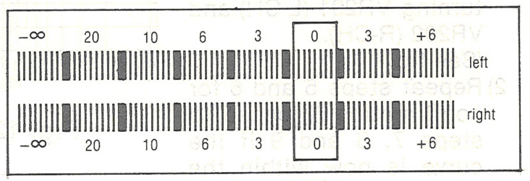

−∞
20
10
6
3
0
3
+6
left
right

Fig. 17

⓫ Dolby NR circuit

Condition:
- Record mode/playback mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch ...B/C
- Input level controls...MAX
- Balance control...center

Equipment:
- EVM (Electronic Voltmeter)
- ATT
- Resistor (600Ω)
- AF oscillator
- Oscilloscope

- Check of the Dolby-B type encoder characteristics

1. Make connections as shown in fig. 18.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at Pin 7 of IC3 (L-CH) and IC4 (R-CH) is 12.3mV.
5. The output level at pin 21 should be 0dB.
6. Set the NR select switch to B, and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is +6dB±2dB (753mV).
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 21 should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is +8dB±2dB (948mV).

- Check of Dolby-C type encoder characteristics

9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is 11.5dB±2dB (1.4V).
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at pin 21 should be 0dB (1.4V).
12. Set the NR select switch to C and make sure that the output signal level at pin 21 of IC3 (L-CH) and IC4 (R-CH) is 8.5dB±2dB (1V).

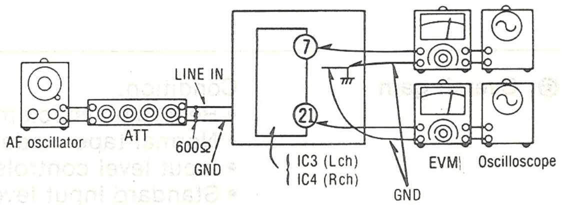
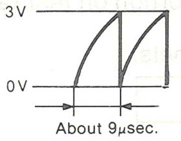
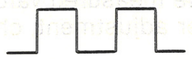
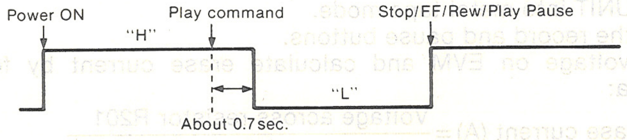
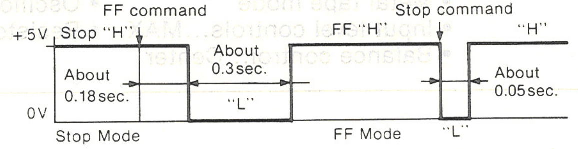
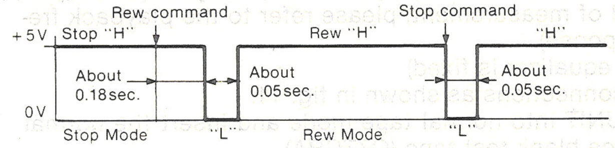
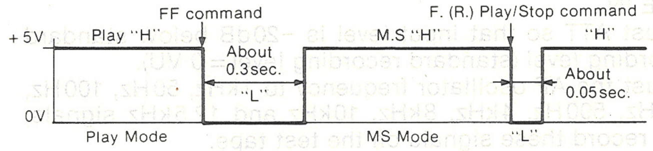
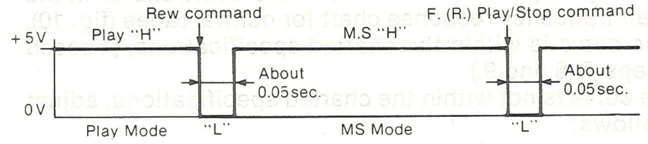
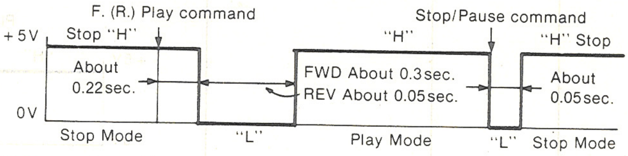
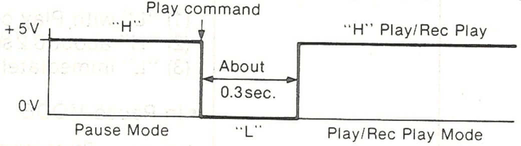
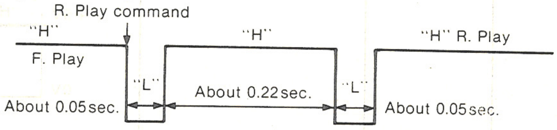
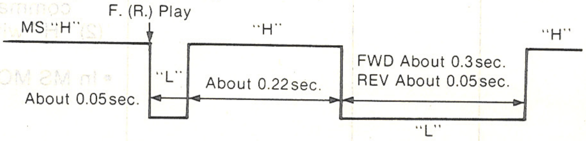
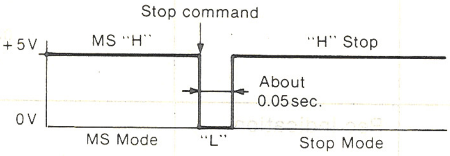
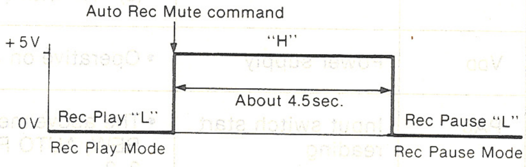

LINE IN
AF oscillator
ATT
600Ω
GND
7
21
IC3 (Lch)
IC4 (Rch)
GND
EVM
Oscilloscope

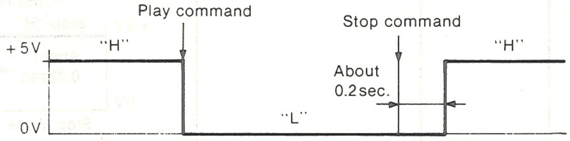
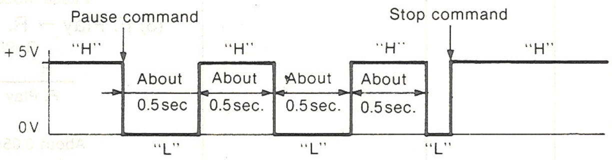
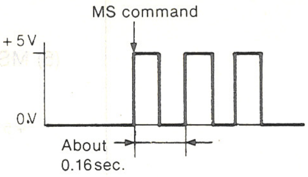
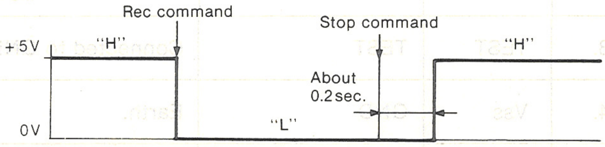
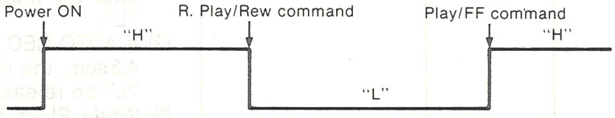
Fig. 18

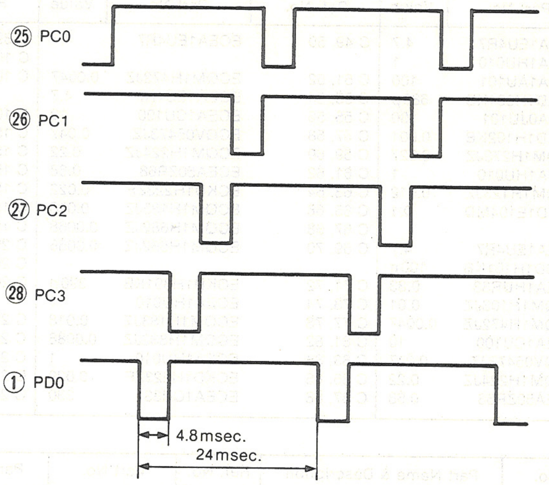
LM6413E1826 (IC901), TERMINAL FUNCTION AND WAVEFORM

- **LM6413E1826**

Terminal No.	Symbol	Name	Function/operation
2.	PD1	Derection SW	Connected to GND.
3.	PD2	Quick IN	• Non Connection.
4.	PD4	MSP IN	• If PD3 is at "L" for about 14sec. in PLAY mode with BLANK SKIP switch ON, then the mode changes to CUE MS. PD3—"L" no signal portion "H" signal portion
5.	EXtal	Clock oscillation	• Clock oscillation of about 180kHz.  3V 0V About 9μsec. • This terminal should be blank during other measurement to keep it free from the influence of the probe.
6.	Xtal		
7.	INT	Reel table pulse input	• Rotation of reel base (with ring magnet) is detected by Hall IC for the detection of tape end. • Rectangular wave input in PLAY, FF, REW, MS. 
8.	RST	Reset	• Used to reset the microcomputer when power is thrown in. • Reset at "L" level (0.3VDD or less).
9.	DE0	Audio muting	 Power ON Play command Stop/FF/Rew/Play Pause "H" "L" About 0.7sec. • When the mode is shifted from Stop to Play. The level goes "L" about 0.7sec. after play command. • When the mode is shifted from Pause to Play. The level gone "L" about 0.5sec. after play command. • When the mode is shifred from Stop to Rec Play. The level gone "L" about 0.5sec. after play command. • When the mode is shifted from MS to Play. The level gone "L" about 0.8sec. after play command.
10.	PE1	Motor out	• "H" in Stop mode. "L" in other modes.
11.	PE2	FF/Rew plunger out	• "L" for a short time in FF/REW/MS operation changeover. (1) Stop → FF → Stop  FF command Stop command +5V Stop "H" FF "H" "H" About 0.18sec. About 0.3sec. "L" About 0.05sec. 0V Stop Mode FF Mode "L" (2) Stop → Rew → Stop  Rew command Stop command +5V Stop "H" Rew "H" "H" About 0.18sec. About 0.05sec. About 0.05sec. 0V Stop Mode "L" Rew Mode "L" (3) Play → MS (FF) → F. (R.) Play/Stop  FF command F. (R.) Play/Stop command +5V Play "H" M.S "H" "H" About 0.3sec. "L" About 0.05sec. 0V Play Mode MS Mode "L" (4) Play → MS (Rew) → F. (R.) Play/Stop  Rew command F. (R.) Play/Stop command +5V Play "H" M.S "H" About 0.05sec. About 0.05sec. 0V Play Mode "L" MS Mode "L"

Terminal No.	Symbol	Name	Function/operation
12.	PE3	Play plunger out	• "L" for a short time in Play/Rec Play/MS operation changeover. (1) Stop → F. Play → Stop/Pause  F. (R.) Play command Stop/Pause command +5V Stop "H" "H" "H" Stop About 0.22sec. FWD About 0.3sec. REV About 0.05sec. About 0.05sec. 0V Stop Mode "L" Play Mode "L" Stop Mode (2) Pause/Rec Pause → F. (R.) Play/F. (R.) Rec Play  Play command +5V "H" "H" Play/Rec Play About 0.3sec. 0V Pause Mode "L" Play/Rec Play Mode (3) F. Play → R. Play  R. Play command "H" F. Play "H" "H" R. Play "L" About 0.22sec. "L" About 0.05sec. About 0.05sec. (4) MS (FF/Rew) → F. (R.) Play  F. (R.) Play MS "H" "H" "H" "L" About 0.22sec. FWD About 0.3sec. REV About 0.05sec. About 0.05sec. "L" (5) MS (FF/Rew) → Stop  Stop command +5V MS "H" "H" Stop About 0.05sec. 0V MS Mode "L" Stop Mode
13.	TEST	TEST	Connected to GND.
14.	Vss	GND	Earth.
15.	RF0	Rec mute	• In REC PAUSE mode, "H" with AUTO REC MUTE button pressed; "L" with the button released. • In REC PLAY mode, (1) "H" with AUTO REC MUTE button pressed, and about 4.5sec. later the mode changes to REC PAUSE, then the level goes "L". (2) If AUTO REC MUTE button is depressed for longer than about 4.5sec., the mode changes to REC PAUSE and the level goes "L" on releasing the button. (3) When PLAY button is pressed within 4.5sec. after pressing AUTO REC MUTE button, the mode changes to REC PLAY and the level goes "L".  Auto Rec Mute command +5V "H" About 4.5sec. 0V Rec Play "L" Rec Pause "L" Rec Play Mode Rec Pause Mode
16.	PF1	Direction LED	• In FWD MODE "H". • In REV MODE "L". • In Power ON MODE "H".

Terminal No.	Symbol	Name	Function/operation
17.	PF2	Play/Pause/MS indication	● In Play MODE.  Play command Stop command +5V “H” “H” About 0.2sec. “L” 0V (1) “L” with Play command received. (2) “H” about 0.2sec. after STOP command. (3) “L” immediately after power ON in Timer Play mode. ● In Pause MODE  Pause command Stop command +5V “H” “H” “H” “H” About 0.5sec About 0.5sec. About 0.5sec. About 0.5sec. 0V “L” “L” “L” (1) “L” and “H” are repeated by about 1sec. cycle with PAUSE command received. (2) “H” with STOP command received. ● In MS MODE  MS command +5V 0V About 0.16sec.
18.	PF3	Rec Indication	 Rec command Stop command +5V “H” “H” About 0.2sec. “L” 0V (1) “L” with REC command received. (2) “H” about 0.2sec after STOP command. (3) “L” immediately after power ON in Timer REC mode.
19.	PG0	Up/Down command	 Power ON R. Play/Rew command Play/FF command “H” “H” “L” (1) In Power ON mode “H”. (2) “L” with R. PLAY or REW button pressed. (3) “H” with F. PLAY or FF button pressed.
20.	V_{DD}	Power supply	● Operative on about 5.2 volts.
21.	PA0	Input switch start reading	● The above-mentioned input is read according to the scanning of REW, AUTO REC MUTE, REV MODE (⟲), REC INH (F), PC0, 1, 2, 3.
22.	PA1	Input switch start reading	● The above-mentioned input is read according to the scanning of FF, PAUSE, REV MODE (⤻), REC INH (R), PC0, 1, 2.
23.	PA2	Input switch start reading	● The above-mentioned input is read according to the scanning of R, PLAY, REC, Timer PLAY, FF/REW MODE SW, PC0, 1, 2, 3.
24.	PA3	Input switch start recording	● The above-mentioned input is read according to the scanning of F, PLAY, STOP, Timer REC, BS SW, PLAY MODE SW, PC1, 2.

Terminal No.	Symbol	Name	Function/operation
25.	PC0	Input scan	 ㉕ PC0 ㉖ PC1 ㉗ PC2 ㉘ PC3 ① PD0 4.8msec. 24msec.
26.	PC1	Input scan	
27.	PC2	Input scan	
28.	PC3	Input scan	
1.	PD0	Input scan	
			When measuring scanning signal, pull up by connecting about 10kΩ resistor between ①, ㉕ ~ ㉘ pins and V_{DD}.

■ ELECTRICAL PARTS LIST

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

NOTES: RESISTORS
ERD.........Carbon
ERG ......Metal-oxide
ERS.........Metal-oxide
ERO ......Metal-film
ERX.........Metal-film
ERQ ......Fuse type metallic
ERC.........Solid
ERF.........Cement

CAPACITORS
ECBA ......Ceramic
ECG☐ ......Ceramic
ECK☐ ......Ceramic
ECC☐ ......Ceramic
ECF☐ ......Ceramic
ECQM ......Polyester film
ECQE ......Polyester film
ECQF ......Polypropylene
ECE☐ ......Electrolytic
ECE☐N ...Non polar electrolytic
ECQS ......Polystyrene
ECS☐ ......Tantalum
QCS ......Tantalum

Areas

- ∗ [M] U.S.A.
- ∗ [MC] Canada.
- ∗ [E] All European areas except United Kingdom.
- ∗ [EK] United Kingdom.
- ∗ [EH] Holland.
- ∗ [EGA] F.R. Germany.
- ∗ [XA] Asia, Latin America, Middle East and Africa.
- ∗ [XL] Australia.

• RESISTORS

Ref. No.	Part No.	Value
R 1, 2	ERDS2TJ223	22k
R 3, 4	ERDS2TJ102	1k
R 7, 8	ERDS2TJ273	27k
R 11, 12	ERDS2TJ821	820
R 15, 16	ERDS2TJ224	220k
R 17, 18	ERDS2TJ224	220k
R 21, 22	ERD25FJ100	10
R 23, 24	ERDS2TJ104	100k
R 25, 26	ERD25FJ101	100
R 27, 28	ERDS2TJ432	4.3k
R 29, 30	ERDS2TJ124	120k
R 31, 32	ERDS2TJ472	4.7k
R 33, 34	ERDS2TJ183	18k
R 35, 36	ERDS2TJ472	4.7k
R 37, 38	ERDS2TJ562	5.6k
R 39	ERDS2TJ223	22k
R 41, 42	ERDS2TJ102	1k
R 43	ERDS2TJ561	560
R 44	ERDS2TJ223	22k
R 45, 46	ERDS2TJ272	2.7k
R 47	ERDS2TJ221	220
R 48	ERD25TJ393	39k
R 49	ERDS2TJ103	10k
R 50	ERDS2TJ104	100k
R 51, 52	ERDS2TJ474	470k
R 53, 54	ERDS2TJ472	4.7k
R 55, 56	ERDS2TJ102	1k
R 59, 60	ERDS2TJ512	5.1k
R 61, 62	ERDS2TJ683	68k
R 63, 64	ERDS2TJ222	2.2k
R 65, 66	ERDS2TJ823	82k
R 67, 68	ERDS2TJ272	2.7k
R 69, 70	ERDS2TJ472	4.7k
R 71, 72	ERDS2TJ332	3.3k
R 73, 74	ERDS2TJ102	1k
R 75, 76	ERDS2TJ333	33k
R 77, 78	ERDS2TJ823	82k
R 79, 80	ERD25FJ182	1.8k
R 81, 82	ERDS2TJ103	10k
R 83, 84	ERD25FJ102	1k
R 85, 86	ERDS2TJ102	1k
R 87, 88	ERDS2TJ820	82
R 89, 90	ERDS2TJ680	68
R 91, 92	ERDS2TJ103	10k
R 93, 94	ERDS2TJ272	2.7k
R 95, 96	ERD25FJ182	1.8k
R 97, 98	ERDS2TJ122	1.2k
R 99, 100	ERDS2TJ122	1.2k
R 101, 102	ERDS2TJ222	2.2k
R 103	ERDS2TJ223	22k
R 104	ERDS2TJ103	10k
R 105	ERDS2TJ153	15k
R 106, 107	ERD25FJ472	4.7k
R 109, 110	ERDS2TJ473	47k
R 111, 112	ERD25FJ121	120
R 115, 116	ERG12SJ560P	56
R 117, 118	ERDS2TJ152	1.5k
R 119, 120	ERDS2TJ474	470k
R 121, 122	ERDS2TJ123	12k
R 123	ERDS2TJ224	220k
R 131, 132	ERDS2TJ681	680
R 153	ERDS2TJ102	1k
R 154	ERDS2TJ181	180
R 155	ERDS2TJ103	10k
R 156	ERDS2TJ563	56k
R 157	ERDS2TJ222	2.2k
R 160	ERDS2TJ222	2.2k
R 161	ERDS2TJ103	10k
R 164	ERDS2TJ272	2.7k
R 165, 166	ERDS2TJ471	470
R 167	ERDS2TJ103	10k
R 168	ERDS2TJ102	1k
R 169, 170	ERDS2TJ103	10k
R 171	ERDS2TJ682	6.8k
R 172	ERD25FJ101	100
R 173	ERDS2TJ473	47k
R 174	ERDS2TJ103	10k
R 175	ERDS2TJ102	1k
R 176	ERDS2TJ333	33k
R 178	ERDS2TJ563	56k
R 179	ERDS2TJ103	10k
R 181	ERD25FJ103	10k
R 201	ERD25FJ1R0	1
R 202, 203	ERDS2TJ223	22k
R 204, 205	ERDS2TJ180	18
R 206	ERG12SJ470P	47
R 207	ERG12SJ680P	68
R 208 [EK][XL] ⚠	ERD2FCJ4R7	4.7
R 208 [M][MC] [E][EH][EGA] [XA] ⚠	ERX12SJ4R7P	4.7
R 209, 210 ⚠	ERDS2TJ681	680
R 211 [EK][XL] ⚠	ERD2FCJ4R7	4.7
R 211 [M][MC] [E][EH][EGA] [XA] ⚠	ERX12SJ4R7P	4.7
R 212, 213 [E] [EK][EH][EGA] [XA][XL] ⚠	ERQ14LKR56P	0.56
R 214 [E][EK] [EH][EGA][XA] [XL] ⚠	ERQ14LKR39P	0.39
R 301	ERDS2TJ272	2.7k
R 302, 303	ERDS2TJ472	4.7k
R 304	ERDS2TJ331	330
R 305, 306	ERDS2TJ562	5.6k
R 307, 308	ERDS2TJ153	15k
R 309, 310	ERDS2TJ274	270k
R 311, 312	ERDS2TJ154	150k
R 313, 314	ERDS2TJ153	15k
R 315, 316	ERDS2TJ562	5.6k
R 318	ERDS2TJ221	220
R 319	ERDS2TJ391	390
R 320, 321	ERDS2TJ223	22k
R 323, 324	ERDS2TJ473	47k
R 401	ERDS2TJ122	1.2k
R 901	ERDS2TJ102	1k
R 902	ERDS2TJ683	68k
R 903	ERDS2TJ393	39k
R 904, 905	ERDS2TJ102	1k
R 906	ERDS2TJ222	2.2k

• CAPACITORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
C 3, 4	ECEA1EU4R7	4.7	C 49, 50	ECEA1EU4R7	4.7	C 89, 90	ECEA1HU010	1	C 210	ECKD1H223ZF	0.022
C 7, 8	ECEA1HU010	1				C 101, 102	ECKD1H121KB	120p	C 211 ⚠	ECEA1EU102	1000
C 11	ECEA1AU101	100	C 51, 52	ECQM1H472JZ	0.0047	C 103, 104	ECKD1H821KB	820p	C 212 ⚠	ECEA1EU102	1000
C 13, 14	ECKD1H681KB	680p	C 53, 54	ECEA1EU4R7	4.7				C 215 ⚠	ECEA1CS222	2200
C 15, 16	ECEA0JU101	100	C 55, 56	ECEA1CU100	10	C 105	ECKD1H223ZF	0.022	C 217, 218	ECCD1H101KB	100p
C 17, 18	ECKD1H102KB	0.001	C 57, 58	ECQV05473JZ	0.047	C 152	ECEA1CU221	220			
C 19, 20	ECQM1H273JZ	0.027	C 59, 60	ECQM1H224JZ	0.22	C 153	ECEA1HU010	1	C 219, 220	ECKD1H223ZF	0.022
C 21, 22	ECEA1HU010	1	C 61, 62	ECEA50ZR68	0.68	C 154	ECEA1HU2R2	2.2	C 301, 302	ECEA1HUR47	0.47
C 23, 24	ECQM1H123JZ	0.012	C 63, 64	ECKD1H223ZF	0.022	C 155	ECEA1CU100	10	C 303, 304	ECEA1HU2R2	2.2
C 26	ECFD1E104MD	0.1	C 65, 66	ECQM1H183JZ	0.018	C 156	ECEA1HU010	1	C 305	ECEA1EU4R7	4.7
			C 67, 68	ECQM1H682JZ	0.0068	C 158	ECQM1H103JZ	0.01	C 306	ECFD1H104ZF	0.1
C 29, 30	ECEA1EU4R7	4.7	C 69, 70	ECQM1H562JZ	0.0056	C 201	ECQP1183JZ	0.018	C 501 ⚠	ECKDKC103PFZ	0.01
C 31, 32	ECCD1H101KB	100p				C 202	ECQM1H562JZ	0.0056	C 810	ECFW1E104ZF	0.1
C 33, 34	ECEA1HUR33	0.33	C 71, 72	ECKD1H391KB	390p	C 203	ECQM1H472JZ	0.0047	C 817, 818	ECKW1H152KB	0.0015
C 37, 38	ECQM1H103JZ	0.01	C 73, 74	ECEA1HU010	1				C 901	ECEA0JU101	100
C 39, 40	ECQM1H472JZ	0.0047	C 77, 78	ECQM1H183JZ	0.018	C 204	ECQM1H562JZ	0.0056	C 902	RCBS1H121KBY	120p
C 41, 42	ECEA1CU100	10	C 81, 82	ECQM1H882JZ	0.0088	C 205	ECQM1H472JZ	0.0047			
C 43, 44	ECQV05473JZ	0.047	C 83, 84	ECEA1HU010	1	C 206	ECEA1EU4R7	4.7	C 903	ECEA1HU010	1
C 45, 46	ECQM1H224JZ	0.22	C 85, 86	ECKD1H223ZF	0.022	C 207	ECKD1H223ZF	0.022			
C 47, 48	ECEA50ZR68	0.68	C 87, 88	ECEA1CU331	330	C 208, 209 ⚠	ECEA1CU331	330			

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description
IC 1	M5218L	Integrated Circuit
IC 2	M5220L	Integrated Circuit
IC 3, 4	TEA0665	Integrated Circuit
IC 5, 6, 7	M5218L	Integrated Circuit
IC 301, 302	AN6882	Integrated Circuit
IC 901	LM6413E1826	Integrated Circuit
IC 902	DN6838-S	Integrated Circuit

IC PROTECTOR

Ref. No.	Part No.	Part Name & Description
ICP 901 [EK]	RAHICPF20	IC Protector

TRANSISTORS

Ref. No.	Part No.	Part Name & Description
Q 3, 4, 5	2SD1011-T	Transistor
Q 6	2SA921-T	Transistor
Q 7, 8	2SD1468R	Transistor
Q 9, 10	2SC2603EFG	Transistor
Q 13, 14	2SC2603EFG	Transistor
Q 15, 16	2SD1330R	Transistor
Q 17, 18, 19, 20, 21, 22, 23, 24, 25	2SC2603EFG	Transistor
Q 27, 28	2SD1330R	Transistor
Q 151	2SA1115E	Transistor
Q 152	UN4211	Transistor
Q 153	2SA1115E	Transistor
Q 154	UN4211	Transistor
Q 155	UN4112	Transistor
Q 156	2SB909Q	Transistor
Q 157, 158	2SC2603EFG	Transistor
Q 159	UN4111	Transistor
Q 161, 162	2SC2603EFG	Transistor
Q 201, 202	2SD1225RM	Transistor
Q 203	2SD1265-0	Transistor
Q 204	2SB941-P	Transistor
Q 301	2SB909Q	Transistor
Q 901	2SD592A	Transistor
Q 902	2SB621A-R	Transistor
Q 903, 904	2SB1030R	Transistor

DIODES & RECTIFIERS

Ref. No.	Part No.	Part Name & Description
D 1	1SS133T	Diode
D 151, 153, 154, 155, 156, 157, 158, 159, 160, 161	1SS133T	Diode
D 202, 203	⚠ SVDS1WB10	Rectifier
D 204, 205	MTZ11BT77	Zener
D 206, 207, 208	1SS133T	Diode
D 301, 302, 303, 304, 305, 306, 307, 308	1SS133T	Diode
D 310	1SS133T	Diode
D 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322	LN440YCP	LED
D 323, 324, 325, 326	LN840RCP	LED
D 401, 402, 403	SLV31MC3	Diode LED
D 404	SLV31VC3	Diode LED
D 405	1SS133T	Diose
D 901	MA4056M	Zener
D 902, 903, 904, 905, 906, 907	1SS133T	Diode

VARIABLE RESISTORS

Ref. No.	Part No.	Part Name & Description
VR 1, 2	QVNB3A00B331	P.B Level Adj VR
VR 3	EWAMF5X05G15	Balance Control
VR 4, 5	EWAPA1X05A54	Input Level Control
VR 7, 8	QVNB3A00B223	Overall Gain Adj VR
VR 201, 202	QVNB3A00B104	Bias Current Adj VR

COMBINATION PARTS

Ref. No.	Part No.	Part Name & Description
Z 1, 2, 3, 4	EXRP220K124T	Combination Parts
Z 5, 6	EXRP102K473T	Combination Parts
Z 151	EXRP470K683T	Combination Parts
Z 901	EXBF5E472J	Combination Parts

COILS

Ref. No.	Part No.	Part Name & Description
L 1, 2	QLM9Z10K	MPX Coil
L 3, 4	ELM7Q306A	Skewing Network Coil
L 5, 6	QLQX0332KWA	Peaking Coil
L 7, 8	QLQX0343KWA	Bias Trap Coil
L 201	QLB0202K	Bias Oscillation Coil
L 202	QLQX1021Y	Choke Coil

TRANSFORMERS

Ref. No.	Part No.	Part Name & Description
T 1 [E][EH] [EGA] ⚠	SLT5L237W	Power Transformer
T 1 [M] [MC] ⚠	SLT5L228W	Power Transformer
T 1 [EK] [XL] ⚠	SLT5L238W	Power Transformer
T 1 [XA] ⚠	SLT5L239W	Power Transformer

SWITCHES

Ref. No.	Part No.	Part Name & Description
S 101	QSS1306H	Slide Switch (Timer)
S 301, 302, 303, 304, 305, 306, 307, 308	SSG13	Push Switch
S 309	SSH2100	Push Switch (Mode Selector)
S 310, 311, 312, 313	SSH3084	Push Switch (Tape Selector/NR Selector)
S 501 ⚠	ESB8215V	Push Switch (Power)
S 502 [EK][XA] [XL] ⚠	SSR227	AC Voltage Selector Switch
S 901, 902	RSH1B12ZA-U	Life Switch (Play FF/Rew)
S 903, 904	RSH1A46ZA-U	Life Switch (Rec INH)

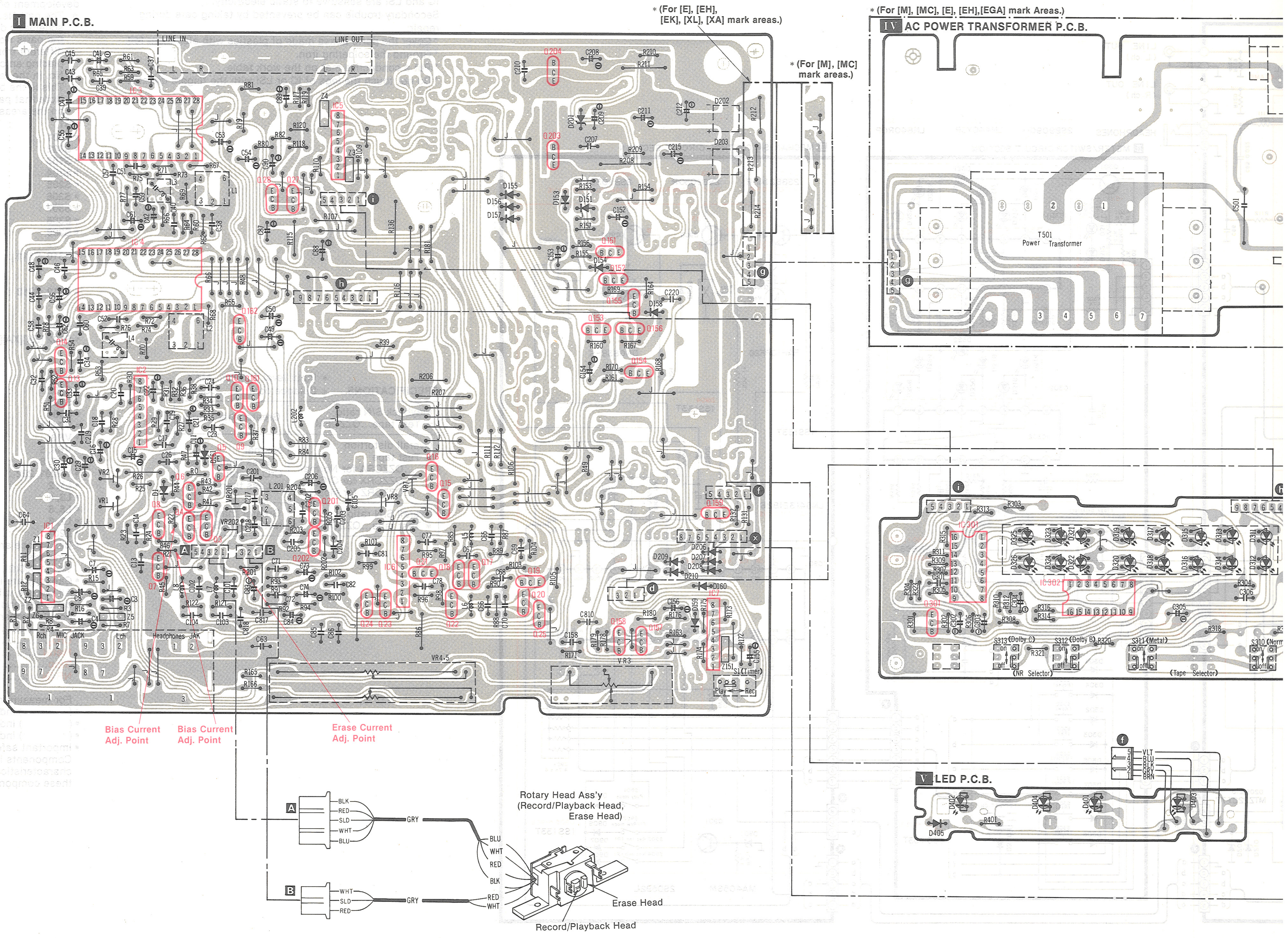
JACKS

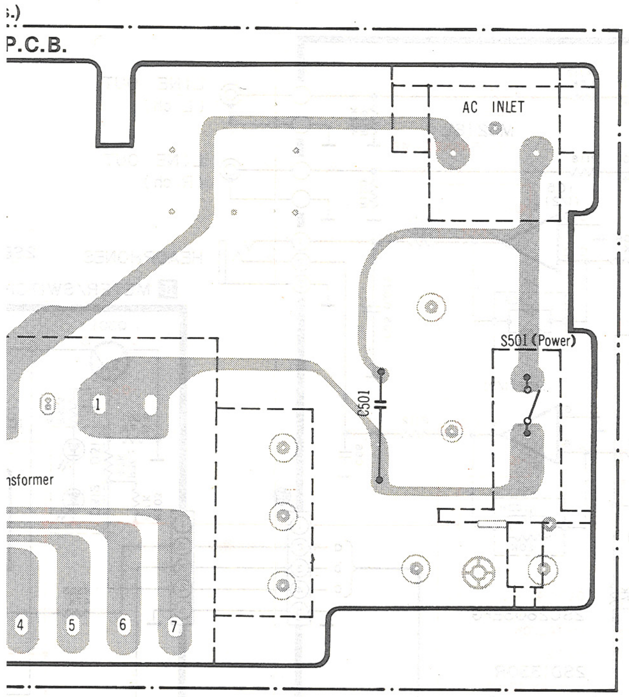
Ref. No.	Part No.	Part Name & Description
J 1	SJJ127HH	Microphone Jack
J 2	SJJ126B	Headphones Jack

CONNECTORS

Ref. No.	Part No.	Part Name & Description
CN 1	B3B-PH	3p Plug
CN 2	B5B-PH	5p Plug
CN 3	QJS1997S	3p Socket
CN 4	QJS1961S	5p Socket
CN 5	QJS1988S	9p Socket
CN 6	SJT3511	5p Connector
CN 7	QJS1989S	10p Socket
CN 8	QJS1990S	12p Socket
CN 9	SJS5523	5p Socket
CN 10	SJT795	Contact

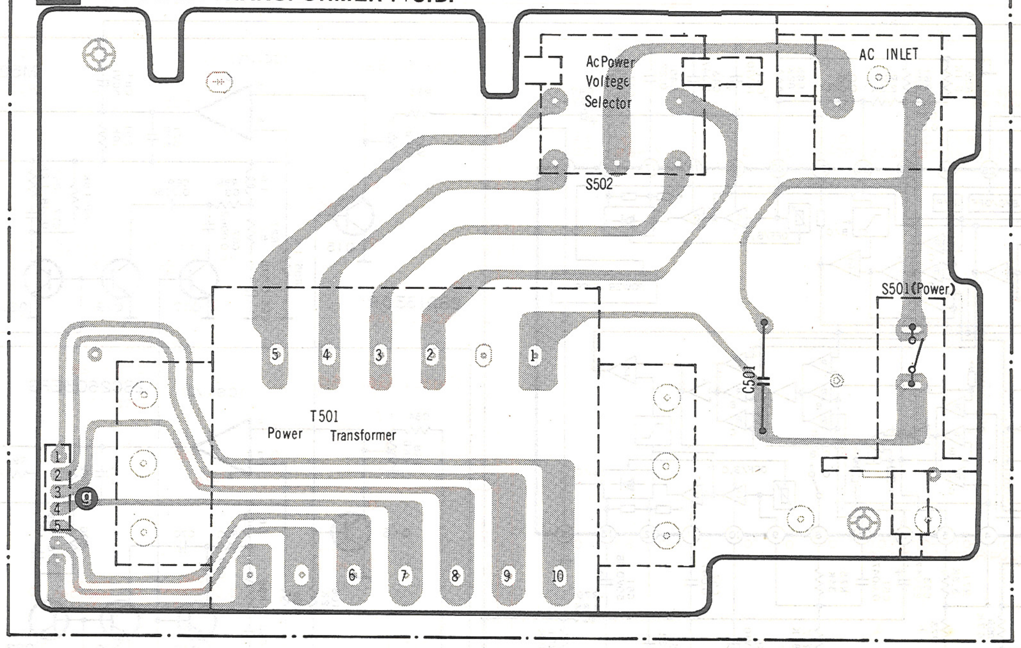
■ PRINTED CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM


I MAIN P.C.B.
LINE IN
LINE OUT
* (For [E], [EH], [EK], [XL], [XA] mark areas.)
* (For [M], [MC] mark areas.)
* (For [M], [MC], [E], [EH],[EGA] mark Areas.)
IV AC POWER TRANSFORMER P.C.B.
T501
Power Transformer
Headphones JAK
MIC JACK
Rch
Lch
VR1
VR2
VR3
VR4·5
VR201
VR202
VR8
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC301
IC302
S1 (Timer)
Play ↔ Rec
S313 (Dolby C)
S312 (Dolby B)
S311 (Metal)
S310 (Norm)
on
off
(NR Selector)
(Tape Selector)
Bias Current Adj. Point
Bias Current Adj. Point
Erase Current Adj. Point
A
B
BLK
RED
SLD
WHT
BLU
GRY
Rotary Head Ass'y (Record/Playback Head, Erase Head)
Erase Head
Record/Playback Head
V LED P.C.B.
VLT
BLU
BLK
GRY
BRN
D401
D402
D403
D404
D405
R401


.)
P.C.B.
AC INLET
S501 (Power)
C501
nsformer
1
4
5
6
7

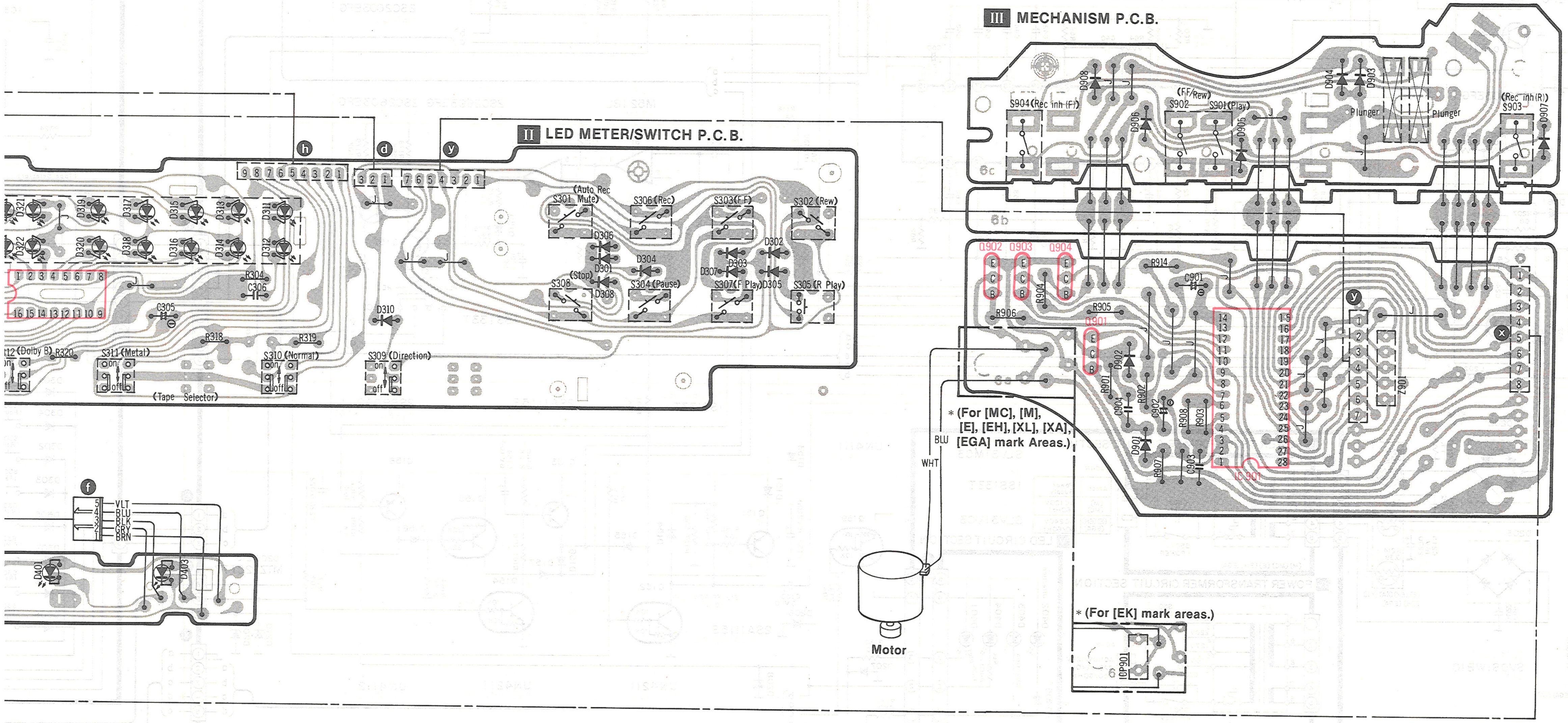
* (For [EK], [XA], [XL] mark areas.)

IV AC POWER TRANSFORMER P.C.B.


Ac Power Voltage Selector
S502
AC INLET
S501 (Power)
C501
T501 Power Transformer
1
2
3
4
5
6
7
8
9
10
g

III MECHANISM P.C.B.

II LED METER/SWITCH P.C.B.

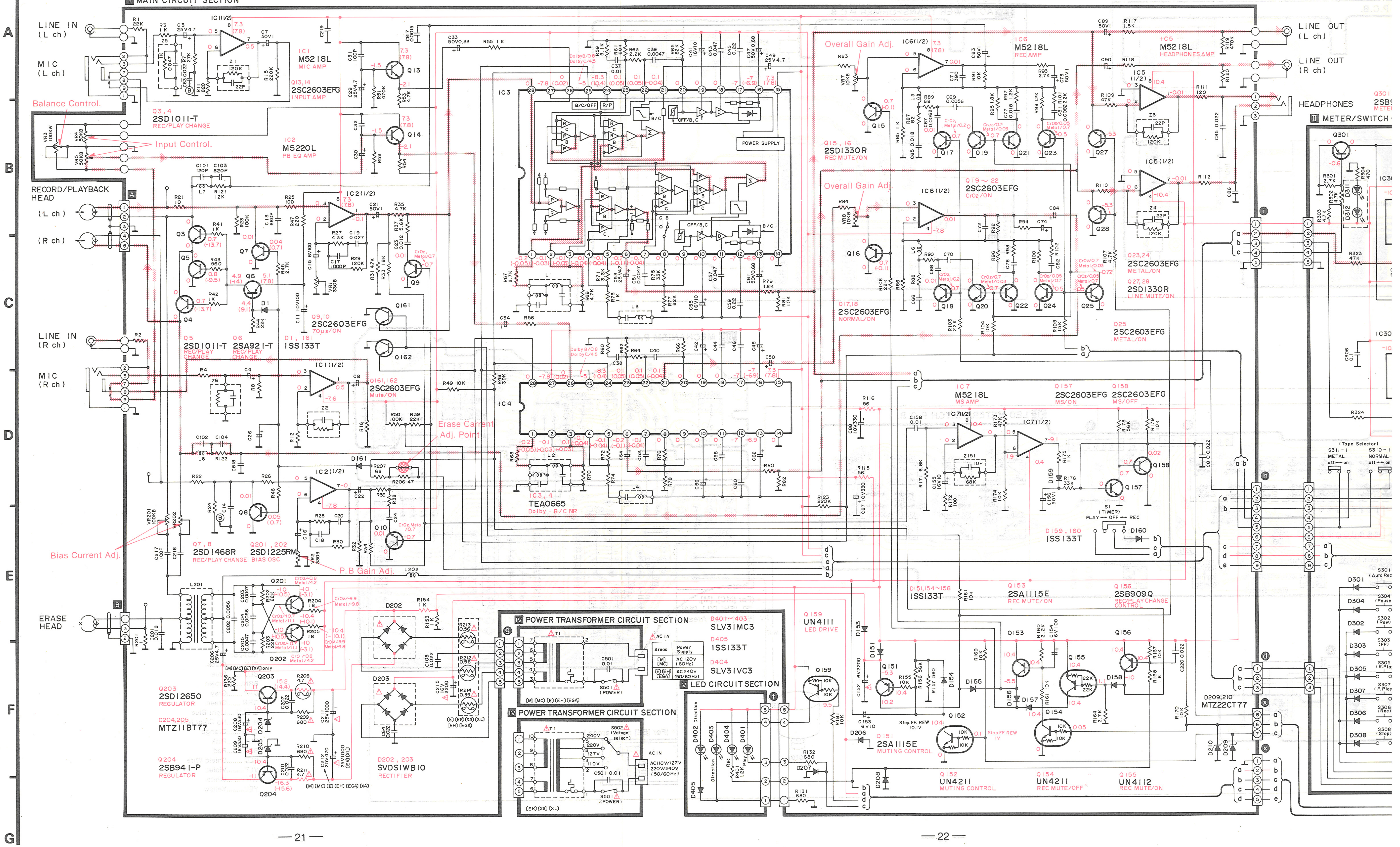

h
d
y
S301 (Auto Rec Mute)
S306 (Rec)
S303 (FF)
S302 (Rew)
S308 (Stop)
S304 (Pause)
S307 (F Play)
S305 (R Play)
D301
D302
D303
D304
D305
D306
D307
D308
D310
D311
D312
D314
D315
D316
D317
D318
D319
D320
D321
D322
R304
C305
C306
R318
R319
R320
S312 (Dolby B)
S311 (Metal)
S310 (Normal)
S309 (Direction)
on
off
(Tape Selector)
f
VLT
BLU
BLK
GRY
BRN
D401
D403
S904 (Rec inh (F))
S902 (FF/Rew)
S901 (Play)
S903 (Rec inh (R))
D904
D903
D905
D906
D907
D908
Plunger
6c
6b
Q902
Q903
Q904
Q901
E
C
B
R914
R904
R905
R906
C901
IC901
R901
R902
R903
R907
R908
C902
C903
C904
D901
D902
IC902
* (For [MC], [M], [E], [EH], [XL], [XA], [EGA] mark Areas.)
BLU
WHT
Motor
* (For [EK] mark areas.)
IDP901

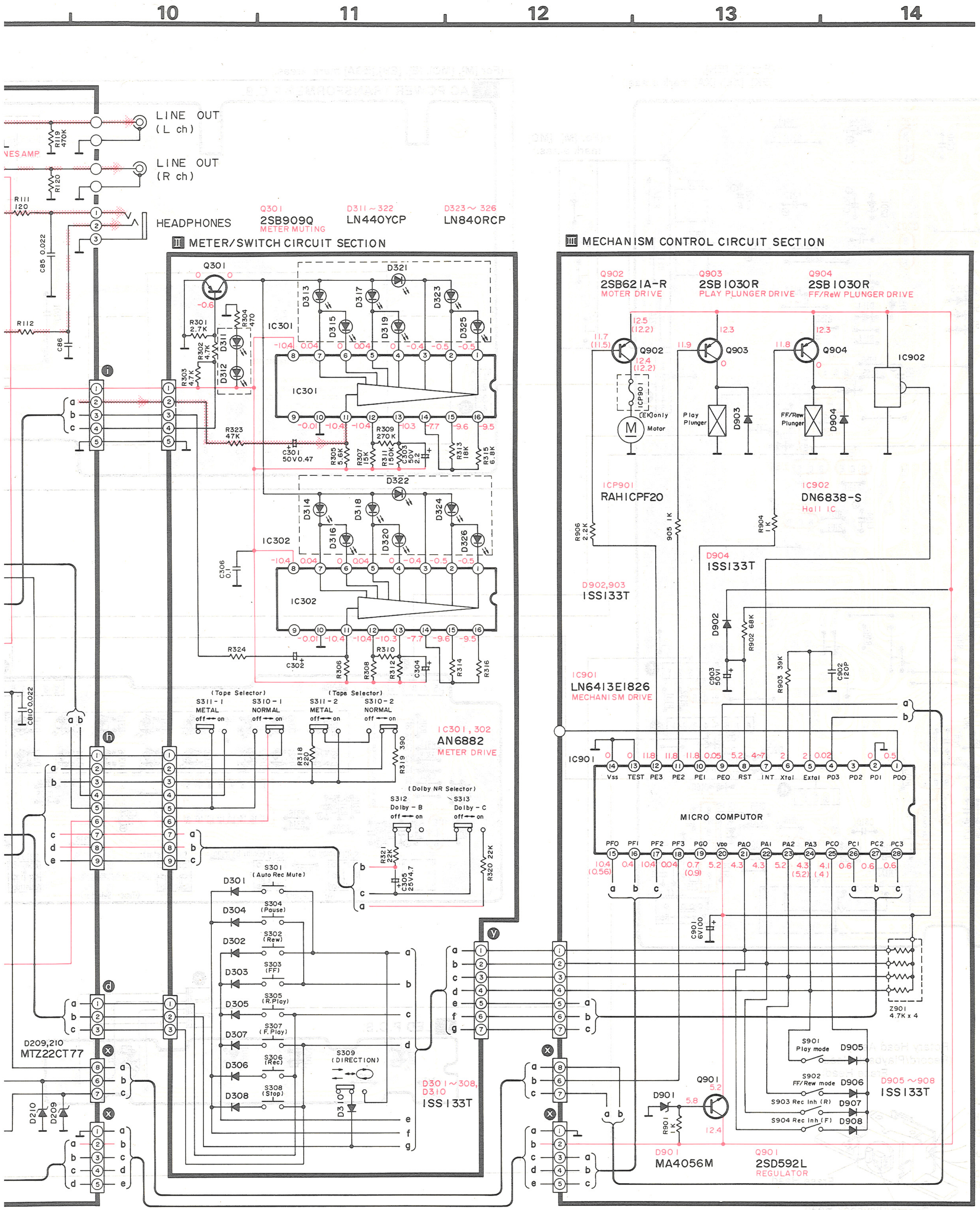
NOTES:

BLK	Black
BLU	Blue
BRN	Brown
GRY	Gray
GRN	Green
L. BLU	Light Blue
NIL	No Color Mark
ORG	Orange
PNK	Pink
RED	Red
SLD	Shield Wire
VLT	Violet
WHT	White
YEL	Yellow

SCHEMATIC DIAGRAM

I MAIN CIRCUIT SECTION


LINE IN (L ch)
MIC (L ch)
Balance Control.
Input Control.
RECORD/PLAYBACK HEAD (L ch) (R ch)
LINE IN (R ch)
MIC (R ch)
Bias Current Adj.
ERASE HEAD
IC1(1/2) IC1 M5218L MIC AMP
Q13,14 2SC2603EFG INPUT AMP
Q3,4 2SD1011-T REC/PLAY CHANGE
IC2 M5220L PB EQ AMP
IC2(1/2)
Q5 2SD1011-T REC/PLAY CHANGE
Q6 2SA921-T REC/PLAY CHANGE
D1,161 1SS133T
Q9,10 2SC2603EFG 70μs/ON
Q161,162 2SC2603EFG Mute/ON
Erase Current Adj. Point
Q7,8 2SD1468R REC/PLAY CHANGE
Q201,202 2SD1225RM BIAS OSC
P.B Gain Adj.
IC3 IC4
IC3,4 TEA0665 Dolby - B/C NR
POWER SUPPLY
Overall Gain Adj.
IC6 M5218L REC AMP
IC5 M5218L HEADPHONES AMP
Q15,16 2SD1330R REC MUTE/ON
Q17,18 2SC2603EFG NORMAL/ON
Q19~22 2SC2603EFG CrO2/ON
Q23,24 2SC2603EFG METAL/ON
Q27,28 2SD1330R LINE MUTE/ON
Q25 2SC2603EFG METAL/ON
LINE OUT (L ch)
LINE OUT (R ch)
HEADPHONES
II METER/SWITCH
IC7 M5218L MS AMP
Q157 2SC2603EFG MS/ON
Q158 2SC2603EFG MS/OFF
D159,160 1SS133T
S1 (TIMER) PLAY ← OFF → REC
(Tape Selector) S311-1 METAL off → on S310-1 NORMAL off → on
D151,154~158 1SS133T
Q153 2SA1115E REC MUTE/ON
Q156 2SB909Q REC/PLAY CHANGE CONTROL
Q159 UN4111 LED DRIVE
Q151 2SA1115E MUTING CONTROL
Q152 UN4211 MUTING CONTROL
Q154 UN4211 REC MUTE/OFF
Q155 UN4112 REC MUTE/ON
D209,210 MTZ22CT77
IV POWER TRANSFORMER CIRCUIT SECTION
D401~403 SLV31MC3
D405 1SS133T
D404 SLV31VC3
V LED CIRCUIT SECTION
D402 Direction D403 D404 Rec D401 Play D405 Direction
Q203 2SD1265O REGULATOR
D204,205 MTZ11BT77
Q204 2SB941-P REGULATOR
D202,203 SVDS1WB10 RECTIFIER
Areas Power Supply (M)(MC) AC 120V (60Hz) (E)(EH)(EGA) AC 240V (50/60Hz)
S502 (Voltage select) 240V 220V 127V 110V
AC110V/127V 220V/240V (50/60Hz)
S501 (POWER)
(M)(MC)(E)(EH)(EGA) (EK)(XA)(XL)


10
11
12
13
14
LINE OUT (L ch)
LINE OUT (R ch)
HEADPHONES
Q301 2SB909Q METER MUTING
D311～322 LN440YCP
D323～326 LN840RCP
III METER/SWITCH CIRCUIT SECTION
III MECHANISM CONTROL CIRCUIT SECTION
Q902 2SB621A-R MOTER DRIVE
Q903 2SB1030R PLAY PLUNGER DRIVE
Q904 2SB1030R FF/Rew PLUNGER DRIVE
IC301
IC302
IC902
ICP901 RAH1CPF20
IC902 DN6838-S Hall IC
D904 ISS133T
D902,903 ISS133T
IC901 LN6413E1826 MECHANISM DRIVE
IC301, 302 AN6882 METER DRIVE
MICRO COMPUTOR
(Tape Selector)
(Dolby NR Selector)
S301 (Auto Rec Mute)
S304 (Pause)
S302 (Rew)
S303 (FF)
S305 (R.Play)
S307 (F.Play)
S306 (Rec)
S308 (Stop)
S309 (DIRECTION)
D301～308, D310 ISS133T
S901 Play mode
S902 FF/Rew mode
S903 Rec Inh (R)
S904 Rec Inh (F)
D905～908 ISS133T
Z901 4.7K x 4
D901 MA4056M
Q901 2SD592L REGULATOR
D209,210 MTZ22CT77
Motor
Play Plunger
FF/Rew Plunger

∗ Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- * Cover the parts boxes made of plastics with aluminum foil.
- * Ground the soldering iron.
- * Put a conductive mat on the work table.
- * Do not touch the legs of IC or LSI with the fingers directly.

SPECIFICATIONS

∗ Input level control...MAX
∗ Balance control......Center

Playback S/N ratio ∗ Test tape...QZZCFM	Greater than 45dB
Overall distortion ∗ Test tape ...QZZCRA for Normal ...QZZCRX for CrO_2 ...QZZCRZ for Metal	Normal Less than 2.1% CrO_2 Metal Less than 2.8%
Overall S/N ratio ∗ Test tape...QZZCRX	Greater than 43dB (without NAB filter)

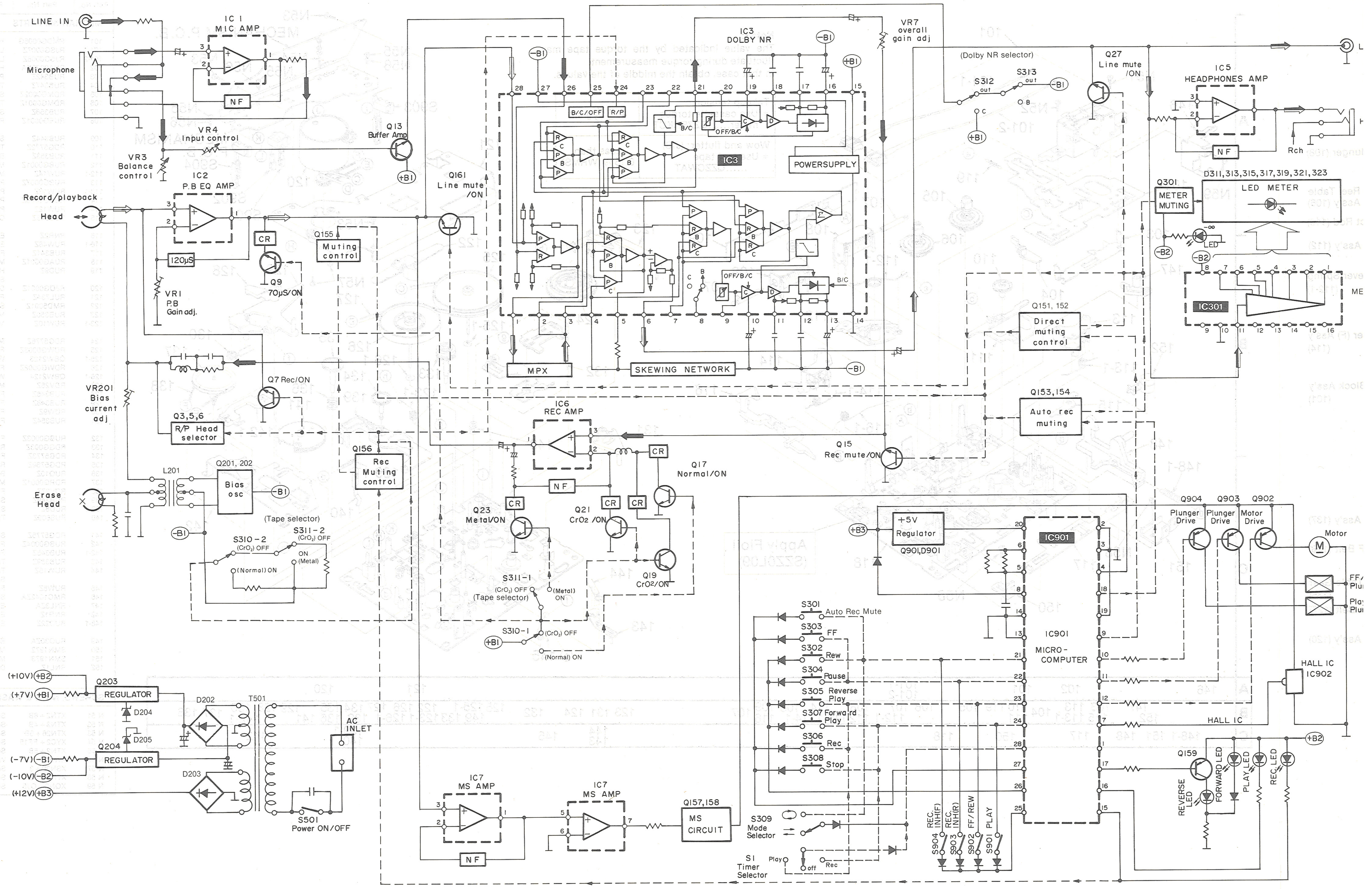
NOTES:

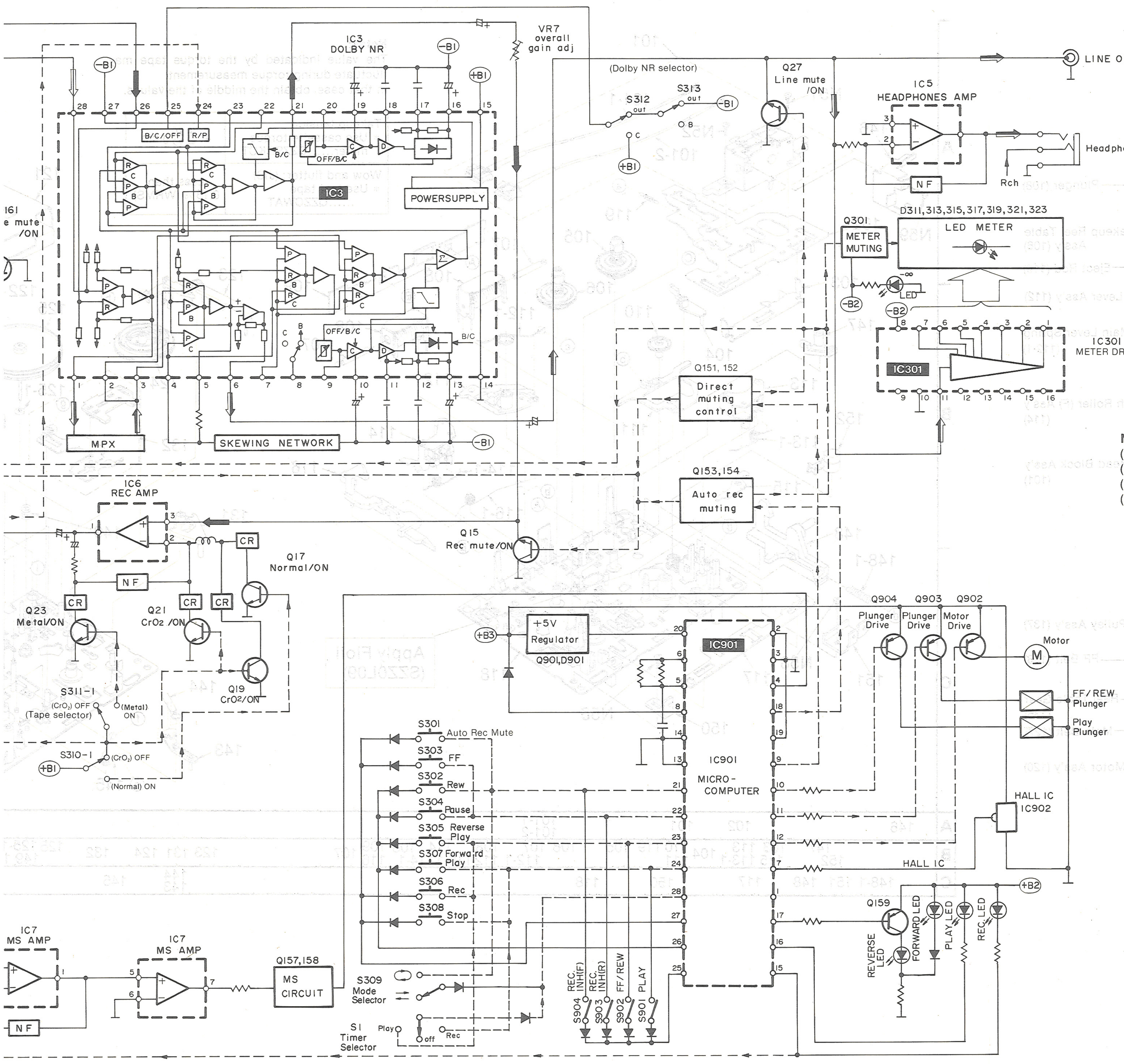
(This schematic diagram may be modified at any time with the development of new technology.)

- ∗ The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the parts No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.
- ∗ This is the basic circuit diagram of this unit.
  Note that part of the circuit is subject to change depending on the areas.

- **S1** : Timer switch in "**OFF**" position.
- **S301** : Auto Rec mute switch in "**OFF**" position.
- **S302** : Rewind switch in "**OFF**" position.
- **S303** : Fast forward switch in "**OFF**" position.
- **S304** : Pause switch in "**OFF**" position.
- **S305** : Revers play switch in "**OFF**" position.
- **S306** : Record switch in "**OFF**" position.
- **S307** : Forward play switch in "**OFF**" position.
- **S308** : Stop switch in "**OFF**" position.
- **S309** : Mode select switch in "⇄" position.
  (▬: ○, ▮: ⇄)
- **S310, S311** : Tape select switch in "**Normal**" position.
  (S310 ▬ : Normal, S311 ▬ : Metal,
  S310, S311 ▮ : CrO_2)
- **S312, S313** : Dolby NR select switch in "**OUT**" position.
  (S312 ▬: Dolby C, S313 ▬: Dolby B,
  S312, S313 ▮ : OUT)
- **S501** : Power switch in "**ON**" position. (▬: ON, ▮: OFF)
- **S502** [EK][XA][XL]
  : Voltage select swich in "**240V**" position.
  (110V ⟷ 127V ⟷ 220V ⟷ 240V)
- **S901** : Play mode switch in "**OFF**" position.
- **S902** : FF/REW mode switch in "**OFF**" position.
- **S903** : Rec inhibit (Revers) switch in "**OFF**" position.
- **S904** : Rec inhibit (Forward) switch in "**OFF**" position.
- **VR1, 2** : Playback level adjustment VR.
- **VR3** : Balance control.
- **VR4, 5** : Input level control.
- **VR7, 8** : Overall gain adjustment VR.
- **VR201, 202** : Bias current adjustment VR.
- **L1, 2** : MPX coil.
- **L3, 4** : Skewing network coil.
- **L5, 6** : Peaking coil.
- **L7, 8** : Bias trap coil.
- **L201** : Bias oscillation coil.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1 K = 1,000(Ω), 1 M = 1,000 k(Ω)
- Capacity are in micro-fards (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ) ....Voltage values at record mode.
  CrO_2............Voltage values at CrO_2 tape mode.
  Metal ....Voltage values at Metal tape mode.
  Stop............Voltage values at Stop mode.
  NR IN ....Voltage value at which the noise reduction switch is turned on.
  For measurement use EVM.
- (──) indicates B (bias).
- (▒) indicates the flow of the playback signal.
- (░) indicates the flow of the recording signal.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

■ BLOCK DIAGRAM

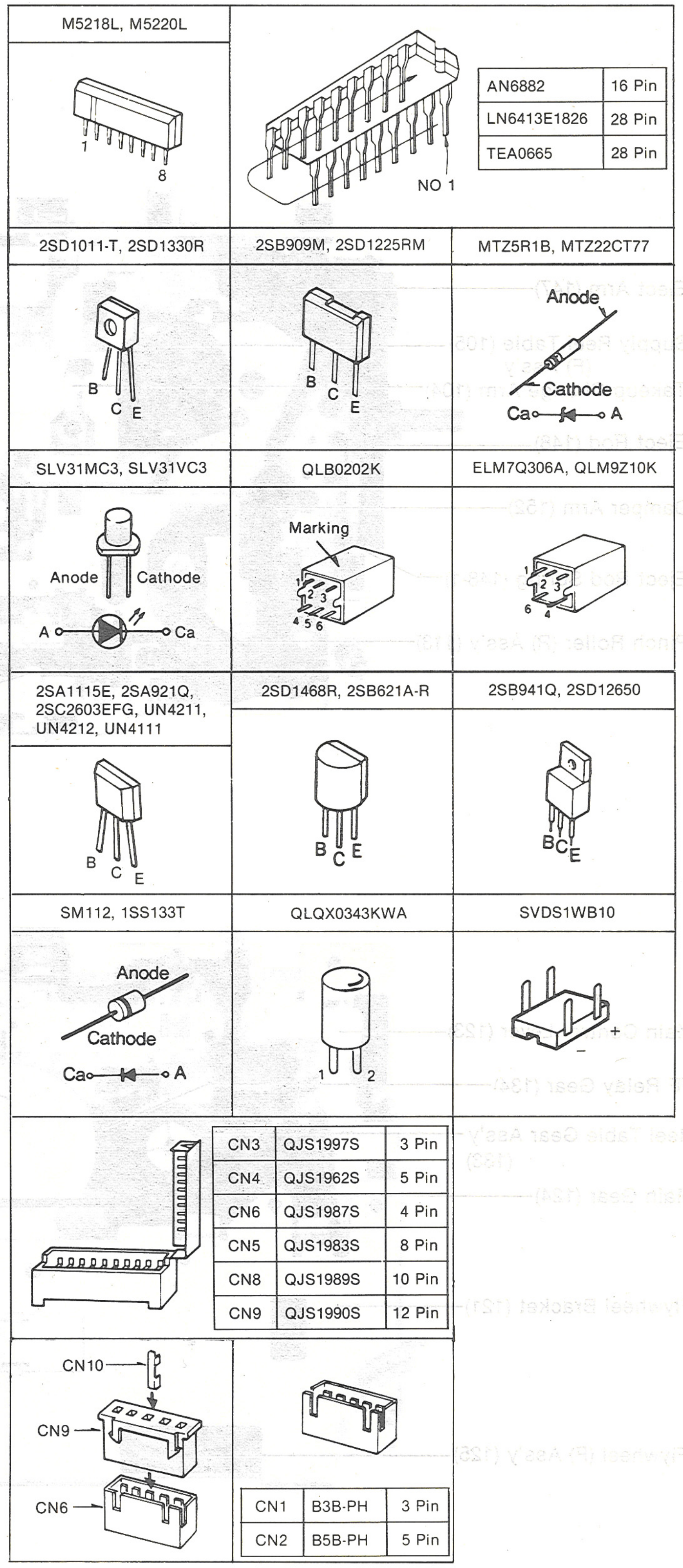

LINE IN
Microphone
IC 1
MIC AMP
NF
VR4
Input control
VR3
Balance
control
Q13
Buffer Amp
+B1
IC2
P.B EQ AMP
Record/playback
Head
CR
120μS
Q9
70μS/ON
VR1
P.B
Gain adj.
Q155
Muting
control
Q161
Line mute
/ON
Q7 Rec/ON
VR201
Bias
current
adj
Q3,5,6
R/P Head
selector
Q156
Rec
Muting
control
L201
Q201, 202
Bias
osc
-B1
Erase
Head
(Tape selector)
S310-2
(CrO₂) OFF
S311-2
(CrO₂) OFF
(Normal) ON
ON
(Metal)
IC3
DOLBY NR
B/C/OFF
R/P
B/C
OFF/B/C
POWERSUPPLY
MPX
SKEWING NETWORK
VR7
overall
gain adj
(Dolby NR selector)
S312
S313
out
Q27
Line mute
/ON
IC5
HEADPHONES AMP
Rch
Q301
METER
MUTING
D311,313,315,317,319,321,323
LED METER
LED
-B2
IC301
Q151, 152
Direct
muting
control
Q153,154
Auto rec
muting
Q15
Rec mute/ON
IC6
REC AMP
NF
CR
Q17
Normal/ON
Q23
Metal/ON
Q21
CrO2 /ON
Q19
CrO2/ON
S311-1
(CrO₂) OFF
(Tape selector)
(Metal)
ON
S310-1
(CrO₂) OFF
(Normal) ON
(+10V) +B2
(+7V) +B1
(-7V) -B1
(-10V) -B2
(+12V) +B3
Q203
REGULATOR
D204
D205
Q204
REGULATOR
D202
D203
T501
AC
INLET
S501
Power ON/OFF
IC7
MS AMP
NF
Q157,158
MS
CIRCUIT
S309
Mode
Selector
S1
Timer
Selector
Play
off
Rec
+B3
+5V
Regulator
Q901,D901
IC901
MICRO-
COMPUTER
S301 Auto Rec Mute
S303 FF
S302 Rew
S304 Pause
S305 Reverse Play
S307 Forward Play
S306 Rec
S308 Stop
S904 REC. INH(F)
S903 REC. INH(R)
S902 FF/REW
S901 PLAY
Q904
Plunger
Drive
Q903
Plunger
Drive
Q902
Motor
Drive
Motor
M
FF/
Plu
Play
Plu
HALL IC
IC902
HALL IC
+B2
Q159
REVERSE LED
FORWARD LED
PLAY LED
REC LED


IC3
DOLBY NR
VR7
overall
gain adj
(Dolby NR selector)
S312
S313
out
C
B
Q27
Line mute
/ON
LINE OUT
IC5
HEADPHONES AMP
Headphones
NF
Rch
B/C/OFF
R/P
B/C
OFF/B/C
IC3
POWERSUPPLY
OFF/B/C
B/C
Q301
METER
MUTING
D311,313,315,317,319,321,323
LED METER
LED
IC301
METER DRIVE
IC301
Q151, 152
Direct
muting
control
Q153,154
Auto rec
muting
MPX
SKEWING NETWORK
IC6
REC AMP
NF
CR
Q15
Rec mute/ON
Q17
Normal/ON
Q23
Metal/ON
Q21
CrO2 /ON
Q19
CrO2/ON
S311-1
(CrO2) OFF
(Tape selector)
(Metal)
ON
S310-1
(CrO2) OFF
(Normal) ON
161
e mute
/ON
+5V
Regulator
Q901,D901
IC901
IC901
MICRO-
COMPUTER
Q904
Plunger
Drive
Q903
Plunger
Drive
Q902
Motor
Drive
Motor
M
FF/REW
Plunger
Play
Plunger
HALL IC
IC902
HALL IC
S301
Auto Rec Mute
S303
FF
S302
Rew
S304
Pause
S305
Reverse
Play
S307
Forward
Play
S306
Rec
S308
Stop
Q159
REVERSE
LED
FORWARD LED
PLAY LED
REC LED
REC.
INH(F)
REC.
INH(R)
FF/REW
PLAY
S904
S903
S902
S901
IC7
MS AMP
IC7
MS AMP
Q157,158
MS
CIRCUIT
NF
S309
Mode
Selector
S1
Timer
Selector
Play
Rec
off
-B1
+B1
-B2
+B2
+B3

Note:

- (⇨) Playback Signal
- (➡) Record Signal
- (⬌) Record/Playback Signal
- (- - -➤) Control Signal

■ TERMINAL GUIDE OF TRANSISTORS DIODES, AND IC'S

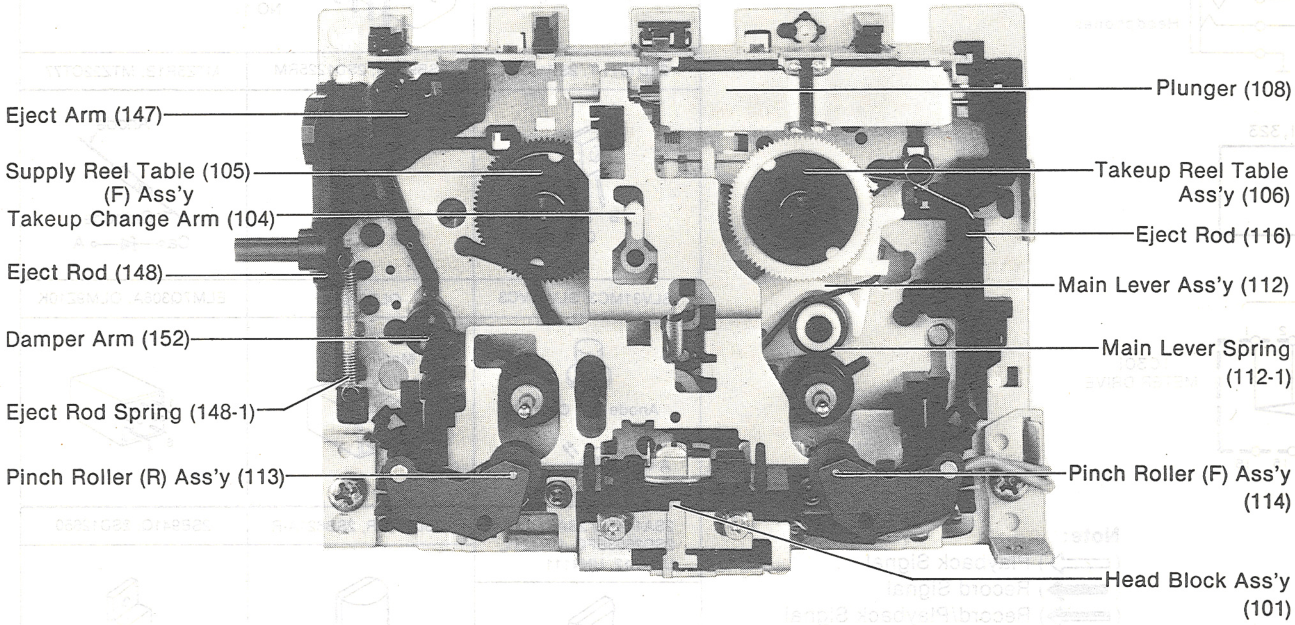

M5218L, M5220L
1
8
NO 1
2SD1011-T, 2SD1330R
B
C
E
2SB909M, 2SD1225RM
B
C
E
MTZ5R1B, MTZ22CT77
Anode
Cathode
Ca
A
SLV31MC3, SLV31VC3
Anode
Cathode
A
Ca
QLB0202K
Marking
ELM7Q306A, QLM9Z10K
2SA1115E, 2SA921Q,
2SC2603EFG, UN4211,
UN4212, UN4111
B
C
E
2SD1468R, 2SB621A-R
B
C
E
2SB941Q, 2SD12650
B
C
E
SM112, 1SS133T
Anode
Cathode
Ca
A
QLQX0343KWA
1
2
SVDS1WB10
+
CN10
CN9
CN6

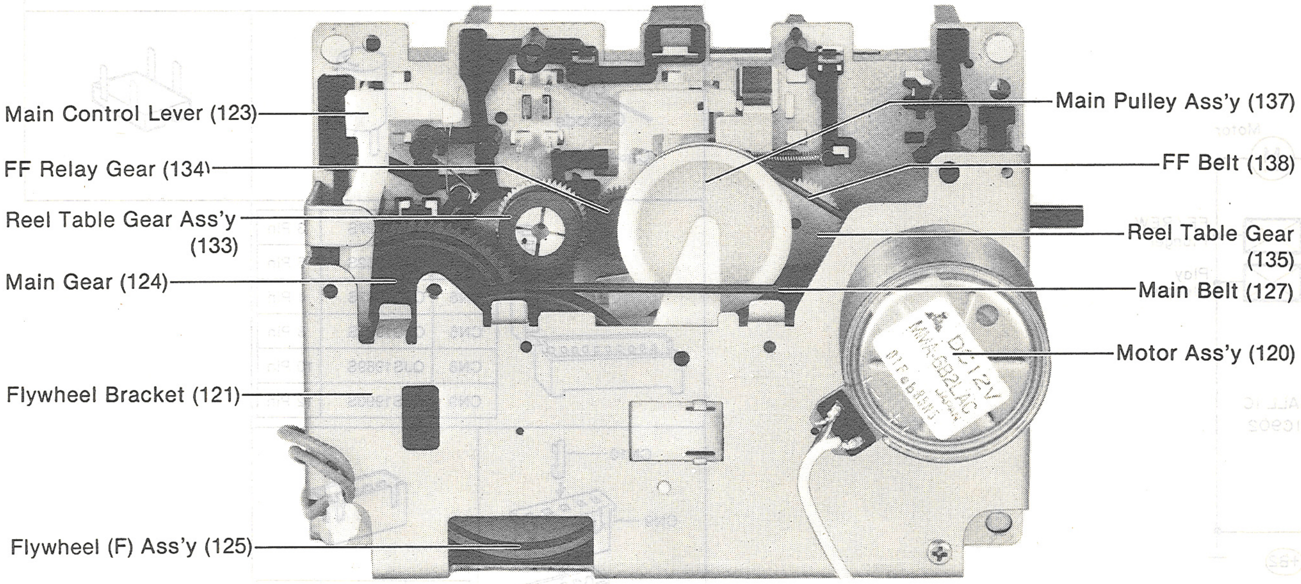
AN6882	16 Pin
LN6413E1826	28 Pin
TEA0665	28 Pin

CN3	QJS1997S	3 Pin
CN4	QJS1962S	5 Pin
CN6	QJS1987S	4 Pin
CN5	QJS1983S	8 Pin
CN8	QJS1989S	10 Pin
CN9	QJS1990S	12 Pin

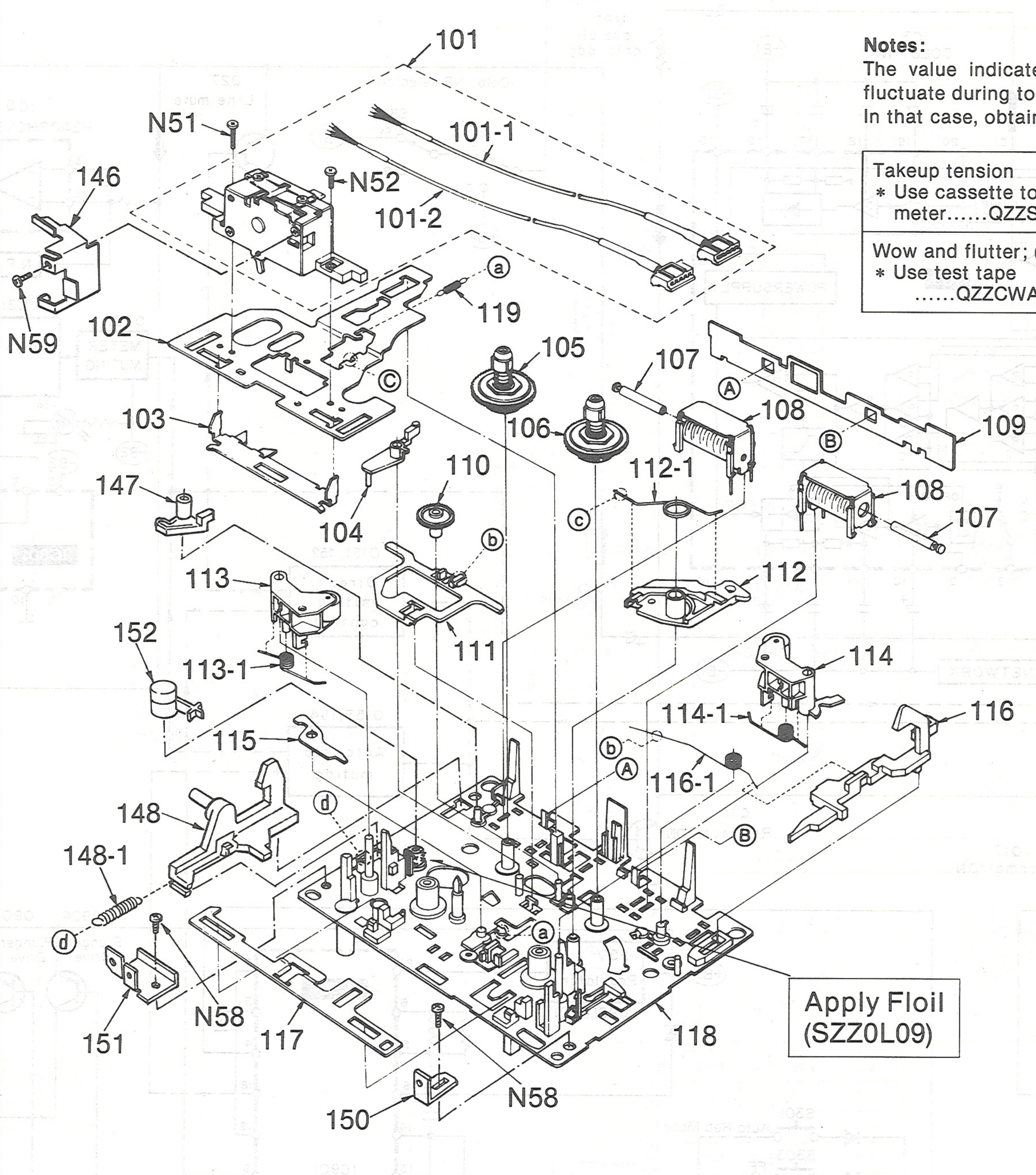
CN1	B3B-PH	3 Pin
CN2	B5B-PH	5 Pin

■ MECHANICAL PARTS LOCATION


Eject Arm (147)
Supply Reel Table (105) (F) Ass'y
Takeup Change Arm (104)
Eject Rod (148)
Damper Arm (152)
Eject Rod Spring (148-1)
Pinch Roller (R) Ass'y (113)
Plunger (108)
Takeup Reel Table Ass'y (106)
Eject Rod (116)
Main Lever Ass'y (112)
Main Lever Spring (112-1)
Pinch Roller (F) Ass'y (114)
Head Block Ass'y (101)


Main Control Lever (123)
FF Relay Gear (134)
Reel Table Gear Ass'y (133)
Main Gear (124)
Flywheel Bracket (121)
Flywheel (F) Ass'y (125)
Main Pulley Ass'y (137)
FF Belt (138)
Reel Table Gear (135)
Main Belt (127)
Motor Ass'y (120)

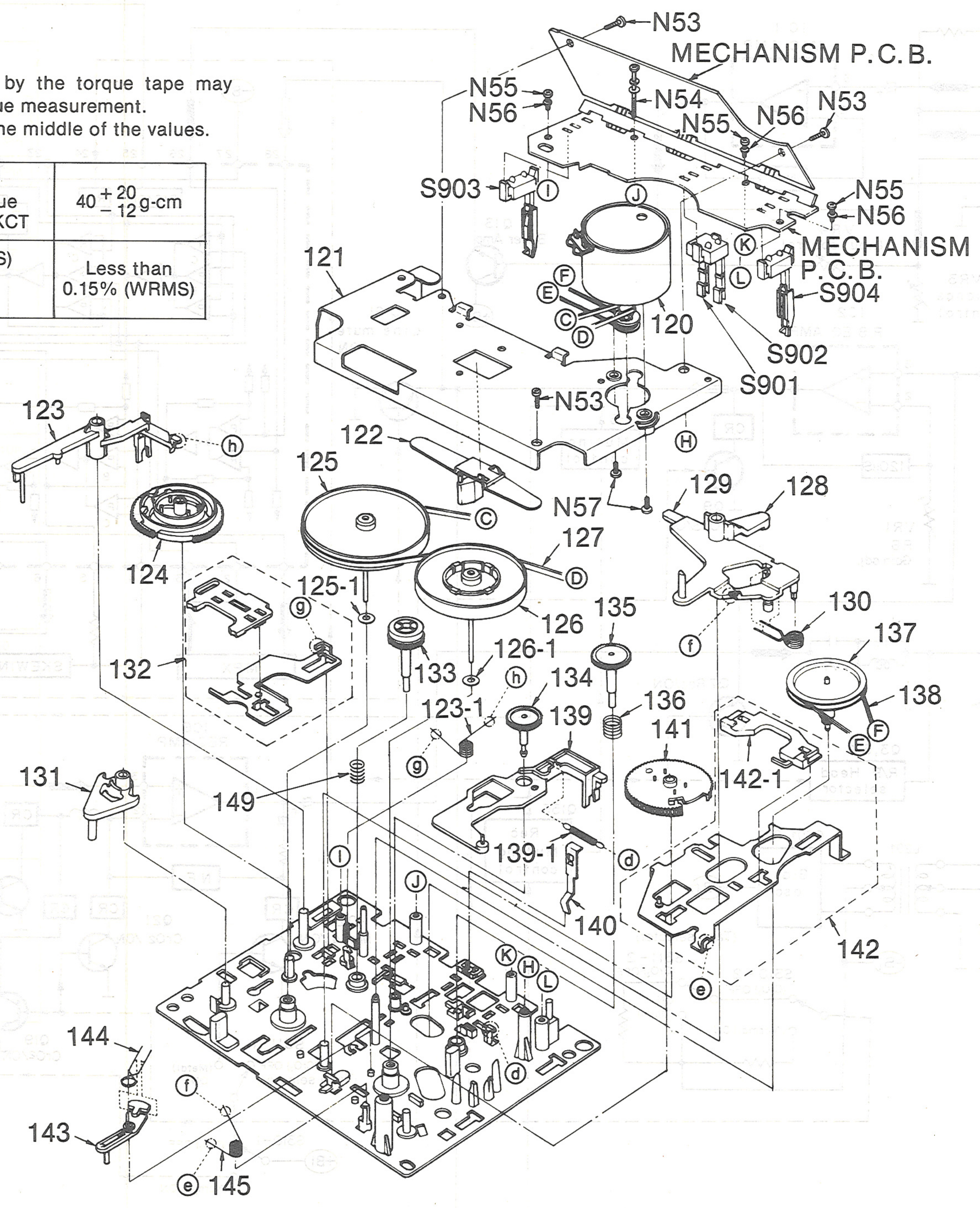
- **Front View**


101
N51
101-1
146
N52
101-2
A
ⓐ
119
N59
102
ⓒ
105
107
Ⓐ
103
106
108
Ⓑ
109
147
110
112-1
104
ⓑ
ⓒ
108
107
113
112
B
152
111
113-1
114
114-1
116
115
ⓑ
Ⓐ
116-1
148
ⓓ
Ⓑ
148-1
ⓐ
ⓓ
151
C
N58
117
118
Apply Floil
(SZZ0L09)
150
N58

- **Back View**

Notes:
The value indicated by the torque tape may fluctuate during torque measurement.
In that case, obtain the middle of the values.

Takeup tension ＊ Use cassette torque meter……QZZSRKCT	40^{+20}_{-12} g-cm
Wow and flutter; (JIS) ＊ Use test tape ……QZZCWAT	Less than 0.15% (WRMS)


N53
MECHANISM P.C.B.
N55
N56
N54
N55
N56
N53
S903
Ⓘ
Ⓙ
N55
N56
Ⓚ
MECHANISM
P.C.B.
Ⓛ
S904
121
Ⓕ
Ⓔ
Ⓒ
Ⓓ
120
S902
S901
N53
123
ⓗ
122
Ⓗ
125
Ⓒ
N57
129
128
127
Ⓓ
124
125-1
ⓖ
126
135
130
ⓕ
137
132
126-1
133
ⓗ
134
136
138
123-1
139
141
Ⓔ
Ⓕ
131
149
ⓖ
142-1
139-1
ⓓ
Ⓘ
Ⓙ
140
142
Ⓚ
Ⓗ
Ⓛ
ⓔ
144
ⓓ
ⓕ
143
ⓔ 145

A	146 102 101 101-1 101-2 121 120
B	147 152 103 113 115 113-1 104 110 111 119 105 106 107 112-1 108 112 114 116-1 114-1 109 116 107 123 131 124 132 125 125-1 149 122 133 123-1 126 126-1 127 134 139 135 136 141 129 128 130 142-1 137 138
C	148-1 151 148 117 150 118 144 143 145 139-1 140 142

REPLACEMENT PARTS LIST

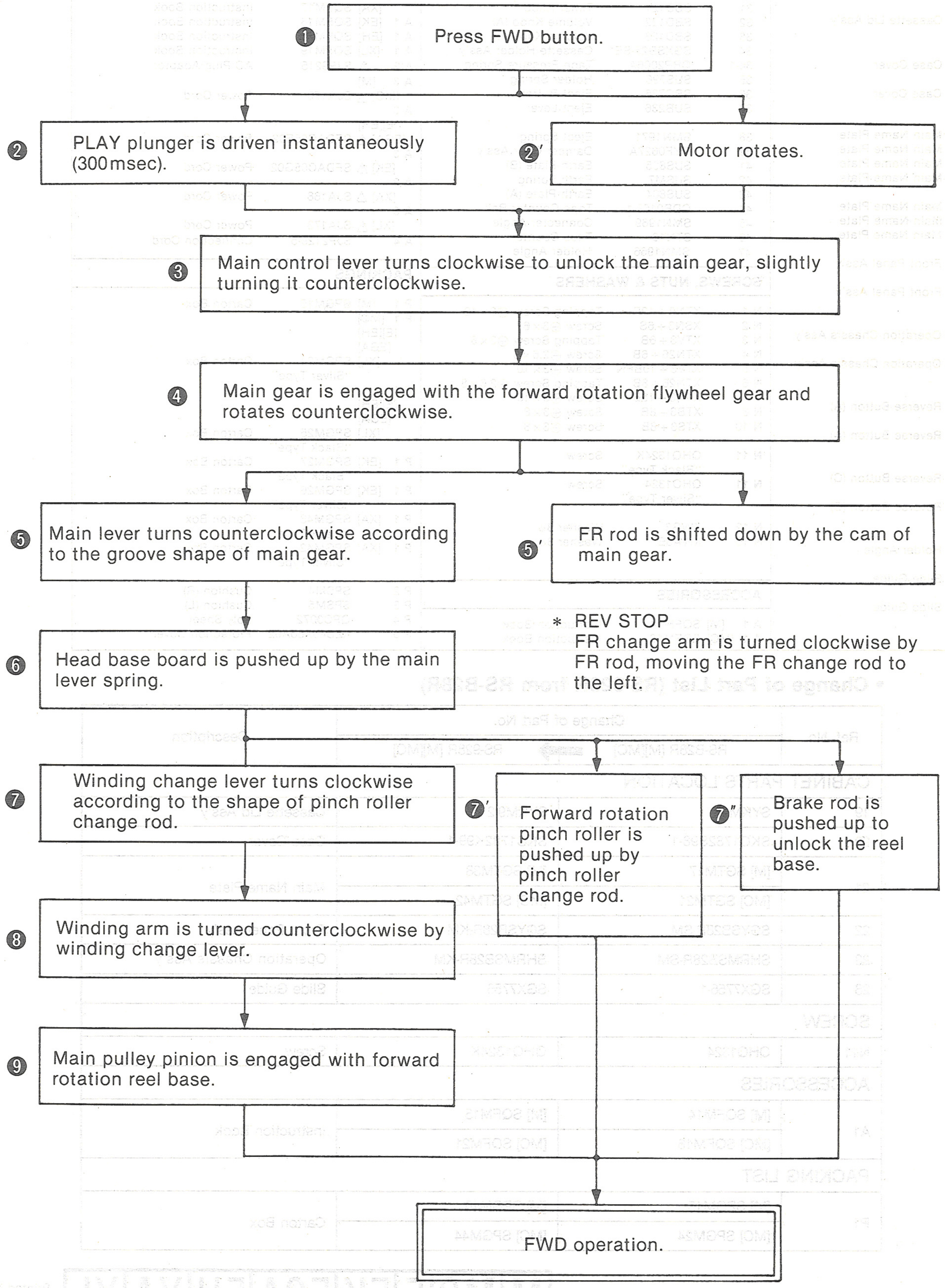
Ref. No.	Part No.	Part Name & Description
MECHANISM PARTS		
101	RMDG0005G	Head Block Ass'y
101-1	RJSG0007Z	Lead Wire, R/P H
101-2	RJSG0008Z	Lead Wire. EH
102	RUA9029XA	Head Base Plate
103	RUB342Z	Pinch Roller Change Rod
104	RUB347Z	Take Up Change Arm
105	RDMG0002Z	Supply Reel Table Ass'y
106	RDMG0001Z	Take Up Reel Table Ass'y
107	RUB358Z	Shaft
108	RUEG0001Z	Plunger Ass'y
109	RUB344Z	Switch Lever
110	RDG5772Z	Take Up Relay Gear
111	RUB353Z	Brake Rod
112	RUBG0001Z	Main Lever Ass'y
112-1	RUW14Z	Main Lever Spring
113	RUBG0007Z	Pinch Roller (R) Ass'y
113-1	RUW13Z	Pinch Roller Spring
114	RUBG0006Z	Pinch Roller (F) Ass'y
114-1	RUW12Z	Pinch Roller Spring
115	RUB343Z	Cue Lever
116	RNR2Z	Eject Rod
116-1	RUW48Z	Eject Rod Spring
117	RUB341Z	FR Change Rod
118	RUAG0001Z	Mecha Chassis
119	RUD9Z	Head Base Plate Return Spring
120	RJQG0001Z	DC Motor Ass'y
121	RUL734Z	Flywheel, Bracket
122	RMD5001Z	Spacer
123	RUB350Z	Main Control Lever
123-1	RUW10Z	Main Control Lever Spring
124	RDG5776Z	Main, Gear
125	RDWG0003Z	Flywheel (F) Ass'y
125-1	QBW2123	Washer (φ2.5)
126	RDWG0002Z	Flywheel (R) Ass'y
126-1	QBW2124	Washer (φ2.2)
127	RDV26Z	Main, Belt (Flat)
128	RUB346Z	FF Arm
129	RUB348Z	FF Spring Lever
130	RUW9Z	FF Arm Spring
131	RUB354Z	FR Change Arm
132	RUBG0003Z	FR Rod Ass'y
133	RDGG003Z	Reel Table Gear Ass'y
134	RDG5773Z	FF Relay Gear
135	RDG5769Z	Reel Table Gear
136	RUQ10Z	Backtension Spring
137	RDRG0001Z	Main Pulley Ass'y
138	RDV27Z	FF, Belt (Square)
139	RUB349Z	Sub Control Lever
139-1	RUD8Z	Sub Control Lever Spring
140	RUS609Z	Tape Pressure Spring
141	RDG5775Z	Sub, Gear
142	RUBG0004Z	FF Rod Ass'y
142-1	RUB345Z	FR Selecte Rod
143	RUB359Z	Take Up Change Lever
144	RUW15Z	Take Up Change Lever Spring
145	RUW8Z	FF Rod Spring
146	RMC1042ZA	Shield Plate
147	· RNL3ZA	Eject Arm
148	RNR1Z	Eject Rod
148-1	RUD22Z	Eject Rod Spring
149	RUQ30ZA	Backtension Spring
150	SMN1972	Mecha Angle (R)
151	SMN1973	Mecha Angle (L)
152	RNL1Z	Damper Arm
SCREWS, NUTS & WASHERS		
N 51	XTN2+8B	Screw ⊕2×8
N 52	XTN2+4B	Screw ⊕2×4
N 53	XTN26+6B	Screw ⊕2.6×6
N 54	XYC2+FF15	Screw ⊕2×15
N 55	XTN2+5B	Screw ⊕2×5
N 56	XWG2	Washer 2φ
N 57	XSN26+3	Screw ⊕2.6×3
N 58	XTN4+6B	Screw ⊕4×6
N 59	XQN2+CJ5	Screw ⊕2×5

■ TECHNICAL GUIDE

• Description of mechanism operation

Employed for this unit is the newly developed record/playback auto reverse mechanism.
The conventional record/playback auto reverse mechanism (RS-8R series) used two motors (for capstan drive and head up/down operation), while this newly developed mechanism usess only one motor for capstan and head up/down operation.
The basic operations (FWD STOP → FWD, FWD → REV) of this mechanism are explained in the following.

1) FWD STOP → FWD PLAY OPERATION



❶ Press FWD button.

❷ PLAY plunger is driven instantaneously (300msec).

❷′ Motor rotates.

❸ Main control lever turns clockwise to unlock the main gear, slightly turning it counterclockwise.

❹ Main gear is engaged with the forward rotation flywheel gear and rotates counterclockwise.

❺ Main lever turns counterclockwise according to the groove shape of main gear.

❺′ FR rod is shifted down by the cam of main gear.

* REV STOP
FR change arm is turned clockwise by FR rod, moving the FR change rod to the left.

❻ Head base board is pushed up by the main lever spring.

❼ Winding change lever turns clockwise according to the shape of pinch roller change rod.

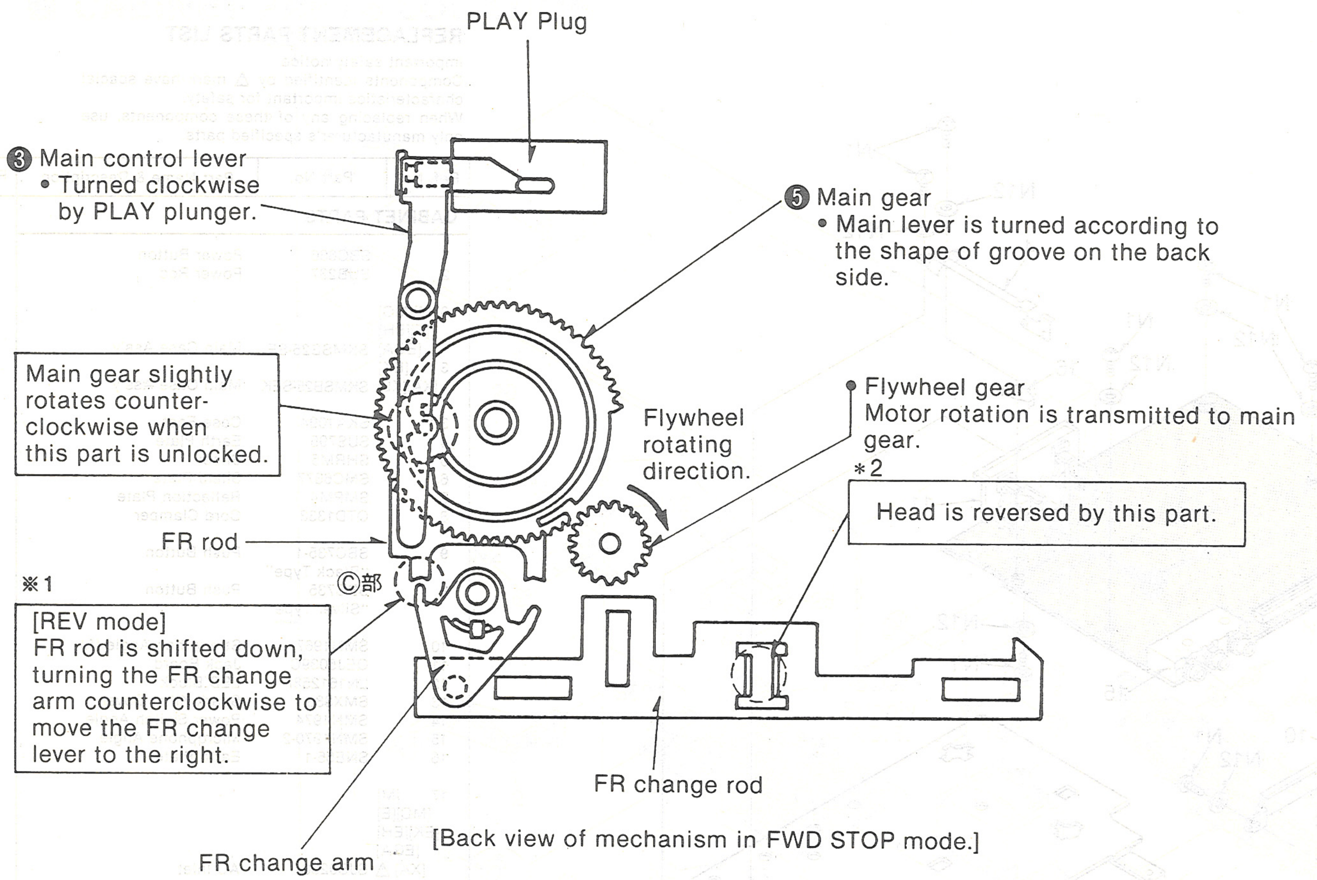
❼′ Forward rotation pinch roller is pushed up by pinch roller change rod.

❼″ Brake rod is pushed up to unlock the reel base.

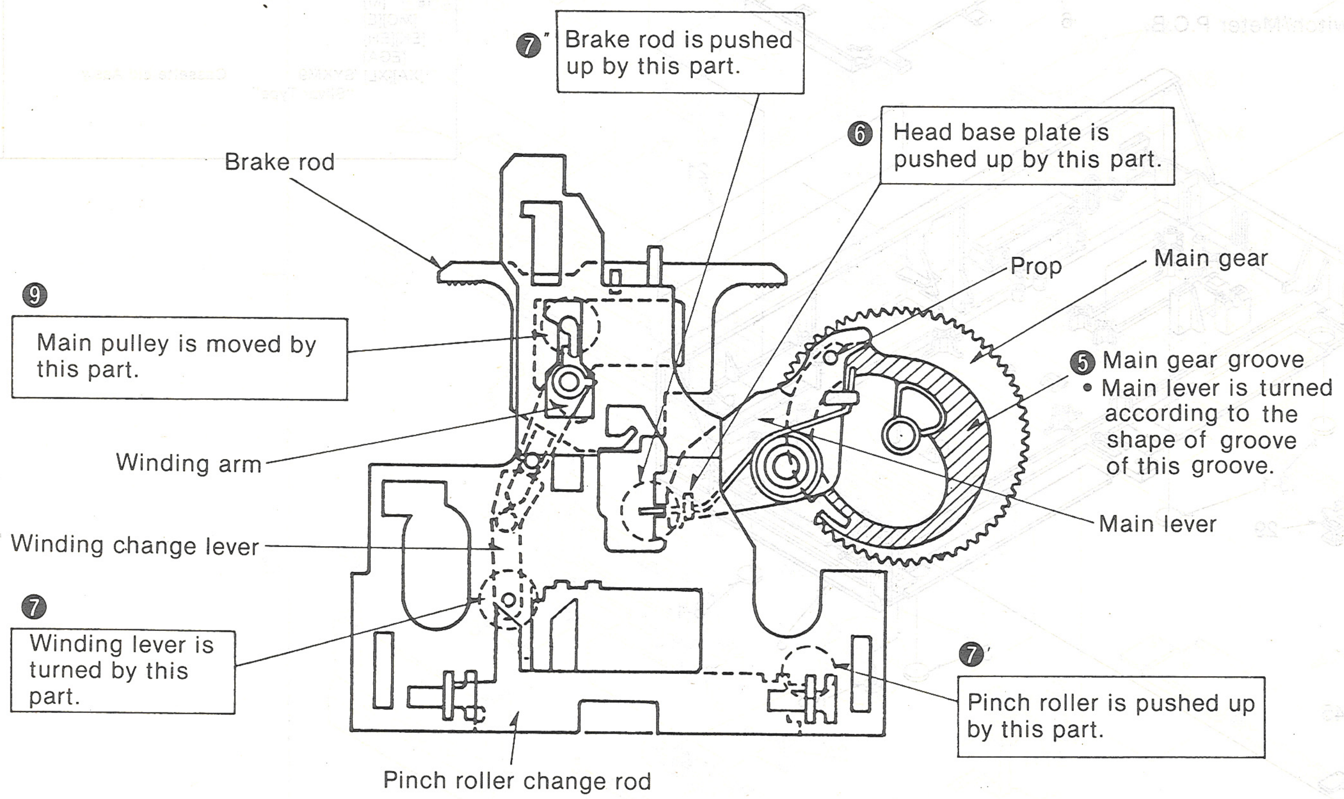
❽ Winding arm is turned counterclockwise by winding change lever.

❾ Main pulley pinion is engaged with forward rotation reel base.

FWD operation.


PLAY Plug
❸ Main control lever
• Turned clockwise by PLAY plunger.
❺ Main gear
• Main lever is turned according to the shape of groove on the back side.
Main gear slightly rotates counter-clockwise when this part is unlocked.
Flywheel rotating direction.
• Flywheel gear
Motor rotation is transmitted to main gear.
＊2
Head is reversed by this part.
FR rod
※1
©部
[REV mode]
FR rod is shifted down, turning the FR change arm counterclockwise to move the FR change lever to the right.
FR change rod
FR change arm

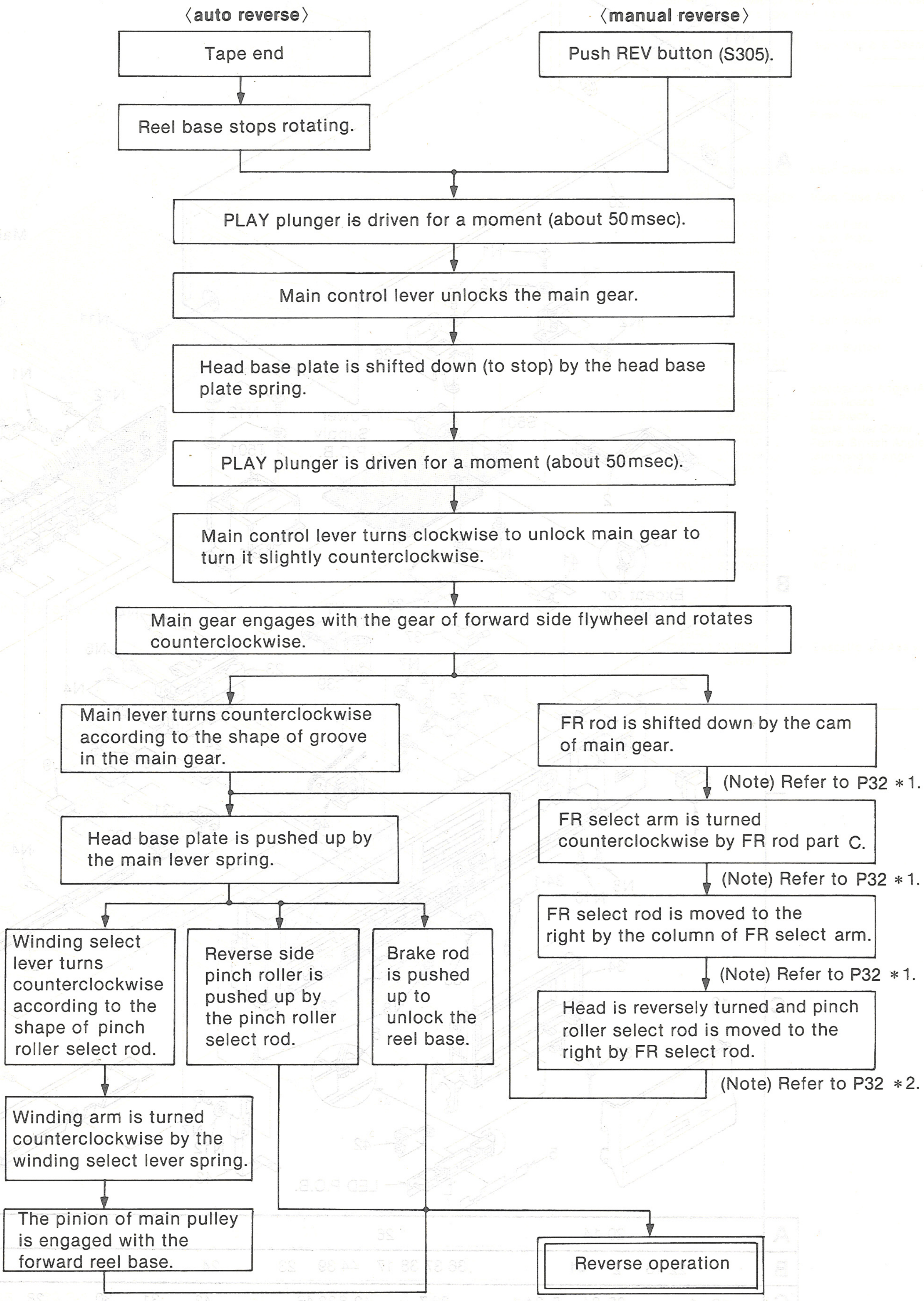
[Back view of mechanism in FWD STOP mode.]


❼″ Brake rod is pushed up by this part.
❻ Head base plate is pushed up by this part.
Brake rod
Prop
Main gear
❾
Main pulley is moved by this part.
❺ Main gear groove
• Main lever is turned according to the shape of groove of this groove.
Winding arm
Main lever
Winding change lever
❼
Winding lever is turned by this part.
❼′
Pinch roller is pushed up by this part.
Pinch roller change rod

[Front view of mechanism in FWD STOP mode.]

2) REVERSE OPERATION (FWD → REV)

◎ For the mechanism illustration, refer to P32.



〈auto reverse〉

Tape end

Reel base stops rotating.

〈manual reverse〉

Push REV button (S305).

PLAY plunger is driven for a moment (about 50 msec).

Main control lever unlocks the main gear.

Head base plate is shifted down (to stop) by the head base plate spring.

PLAY plunger is driven for a moment (about 50 msec).

Main control lever turns clockwise to unlock main gear to turn it slightly counterclockwise.

Main gear engages with the gear of forward side flywheel and rotates counterclockwise.

Main lever turns counterclockwise according to the shape of groove in the main gear.

Head base plate is pushed up by the main lever spring.

Winding select lever turns counterclockwise according to the shape of pinch roller select rod.

Winding arm is turned counterclockwise by the winding select lever spring.

The pinion of main pulley is engaged with the forward reel base.

Reverse side pinch roller is pushed up by the pinch roller select rod.

Brake rod is pushed up to unlock the reel base.

FR rod is shifted down by the cam of main gear.

(Note) Refer to P32 ∗1.

FR select arm is turned counterclockwise by FR rod part C.

(Note) Refer to P32 ∗1.

FR select rod is moved to the right by the column of FR select arm.

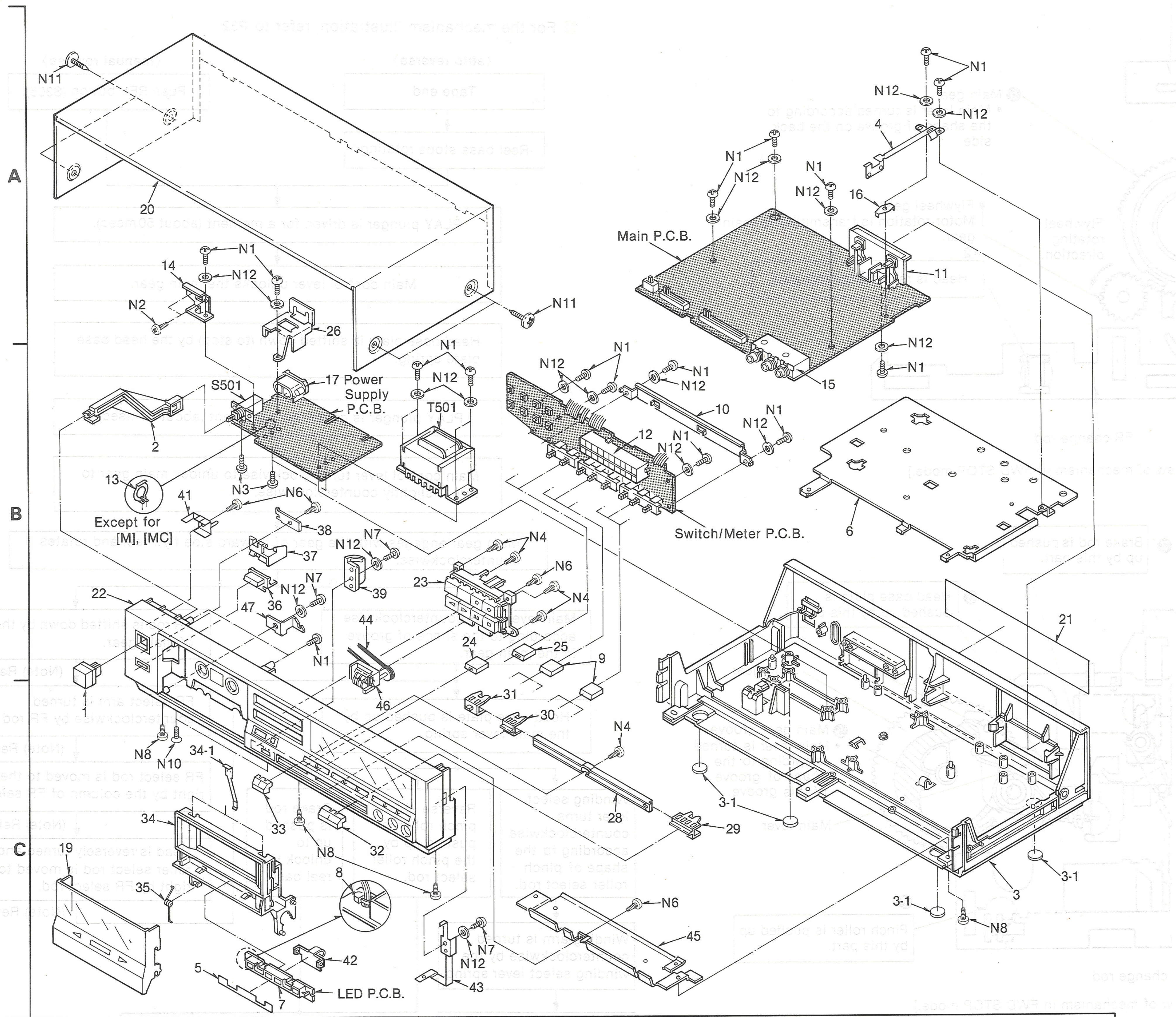
(Note) Refer to P32 ∗1.

Head is reversely turned and pinch roller select rod is moved to the right by FR select rod.

(Note) Refer to P32 ∗2.

Reverse operation

■ CABINET PARTS LOCATION


A
B
C
N11
20
14
N1
N12
N2
26
N11
S501
17 Power Supply P.C.B.
2
13
Except for [M], [MC]
41
N3
N6
38
37
N12
N7
39
N4
N6
23
N4
36
47
N12
N7
N1
44
46
24
25
9
31
30
22
1
N8
N10
34-1
33
32
N8
34
19
35
8
5
7
LED P.C.B.
42
N7
N12
43
28
N4
29
45
N6
T501
N1
N12
12
N12
N1
N12
N1
N12
10
N1
N12
Switch/Meter P.C.B.
Main P.C.B.
N1
N12
N1
N12
16
4
N1
N12
11
15
N12
N1
6
21
3-1
3-1
3-1
3
N8

A	20 14 26 16 4 11
B	22 13 2 41 36 37 38 17 44 39 23 24 25 9 12 10 15 6 21
C	19 1 35 34 5 34-1 33 7 42 8 32 46 43 31 30 28 45 29 3-1 3-1 3 3-1

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

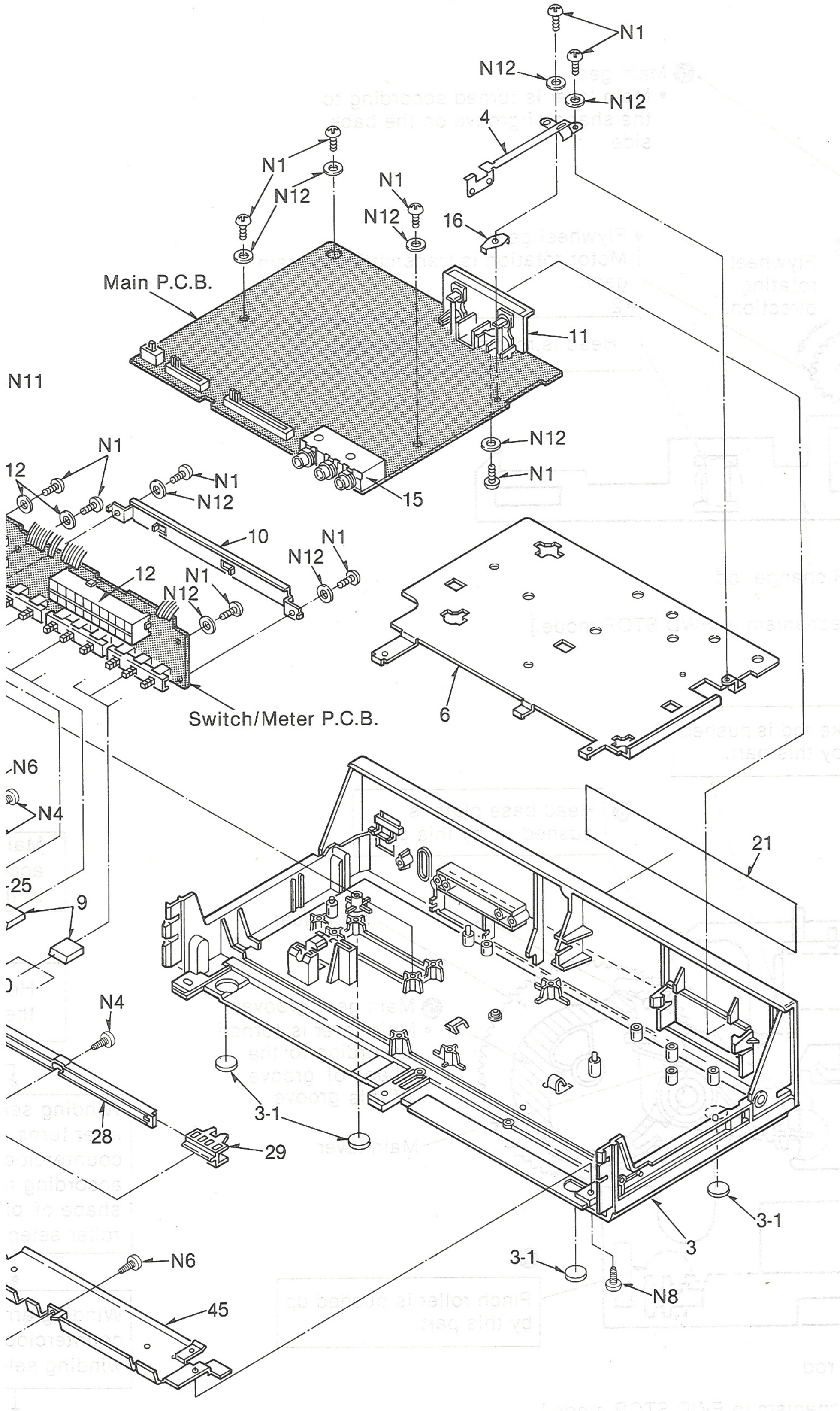
Areas

- ∗ [M] U.S.A.
- ∗ [MC] Canada.
- ∗ [E] All European areas exce
- ∗ [EK] United Kingdom.

Ref. No.	Part No.	Part Name & Description
CABINET PARTS		
1	SBC666	Power Button
2	SUB237	Power Rod
3 [M][MC] [E][EH] [EGA]	SKMSB25-SE	Main Case Ass'y
3 [EK] [XA][XL]	SKMSB25-SEK	Main Case Ass'y
3-1	SKA1094	Case Foot
4	SUS795	Earth Plate
5	SHRM5	Sheet
6	SMC6377	Slield Plate
7	SMPM4	Reflection Plate
8	QTD1333	Cord Clamper
9	SBC735-1 "Black Type"	Push Button
9	SBC735 "Silver Type"	Push Button
10	SMN1967	Strengthen Angle (A)
11	QEJ5039C	Jack Board
12	LN161253P	LED Block
13	SMX888	Spark Killer Cover
14	SMN1974	Power Switch Angle
15	SMN1970-2	Microphone Angle
16	SNE55-1	Earth Plate
17 [M] [MC][E] [EK][EH] [EGA] [XA] ⚠	SJS9230	AC Inlet
17 [XL] ⚠	SJS9235	AC Inlet
19 [M] [MC][E] [EK][EH] [EGA] [XA][XL]	SYKM9 "Silver Type"	Cassette Lid Ass'y
19 [E] [EK][EH] [EGA] [XA][XL]	SYKM9-1 "Black Type"	Cassette Lid Ass'y
20	SKC1782K99-1 "Black Type"	Case Cover
20	SKC1782S98-1 "Silver Type"	Case Cover
21 [M]	SGTM17	Main Name Plate
21 [MC]	SGTM21	Main Name Plate
21 [E]	SGTM22	Main Name Plate
21 [EK]	SGTM24	Main Name Plate
21 [EH] [EGA]	SGTM36	Main Name Plate
21 [XA]	SGTM39	Main Name Plate
21 [XL]	SGTM40	Main Name Plate
22	SGYSB28R-KM "Black Type"	Front Panel Ass'y
22	SGYSB28R-SM "Silver Type"	Front Panel Ass'y
23	SHRMSB28R-KM "Black Type"	Operation Chassis
23	SHRMSB28R-SM "Silver Type"	Operation Chassis
24	SBC735-3 "Black Type"	Reverse Button (A
24	SBC735-2 "Silver Type"	Reverse Button (A
25	SBC735-7 "Black Type"	Reverse Button (C
25	SBC735-6 "Silver Type"	Reverse Button (C
26	SMN1965	Holder Angle
28	SGX7756-1 "Black Type"	Slide Guide
28	SGX7756 "Silver Type"	Slide Guide

• Cha

Ref.
CAE
19
20
21
22
23
28
SCR
N11
ACC
A1
PAC
P1



					16	4	11		
25	9	12	10	15	6			21	
30	28	45	29	3-1	3-1			3	3-1

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Areas

- ∗ [M] U.S.A.
- ∗ [MC] Canada.
- ∗ [E] All European areas except United Kingdom.
- ∗ [EK] United Kingdom.
- ∗ [EH] Holland.
- ∗ [EGA] F.R. Germany.
- ∗ [XA] Asia, Latin America, Middle East and Africa.
- ∗ [XL] Australia.

Ref. No.	Part No.	Part Name & Description
CABINET PARTS		
1	SBC666	Power Button
2	SUB237	Power Rod
3 [M][MC] [E][EH] [EGA]	SKMSB25-SE	Main Case Ass'y
3 [EK] [XA][XL]	SKMSB25-SEK	Main Case Ass'y
3-1	SKA1094	Case Foot
4	SUS795	Earth Plate
5	SHRM5	Sheet
6	SMC6377	Slield Plate
7	SMPM4	Reflection Plate
8	QTD1333	Cord Clamper
9	SBC735-1 "Black Type"	Push Button
9	SBC735 "Silver Type"	Push Button
10	SMN1967	Strengthen Angle (A)
11	QEJ5039C	Jack Board
12	LN161253P	LED Block
13	SMX888	Spark Killer Cover
14	SMN1974	Power Switch Angle
15	SMN1970-2	Microphone Angle
16	SNE55-1	Earth Plate
17 [M] [MC][E] [EK][EH] [EGA] [XA] ⚠	SJS9230	AC Inlet
17 [XL] ⚠	SJS9235	AC Inlet
19 [M] [MC][E] [EK][EH] [EGA] [XA][XL]	SYKM9 "Silver Type"	Cassette Lid Ass'y
19 [E] [EK][EH] [EGA] [XA][XL]	SYKM9-1 "Black Type"	Cassette Lid Ass'y
20	SKC1782K99-1 "Black Type"	Case Cover
20	SKC1782S98-1 "Silver Type"	Case Cover
21 [M]	SGTM17	Main Name Plate
21 [MC]	SGTM21	Main Name Plate
21 [E]	SGTM22	Main Name Plate
21 [EK]	SGTM24	Main Name Plate
21 [EH] [EGA]	SGTM36	Main Name Plate
21 [XA]	SGTM39	Main Name Plate
21 [XL]	SGTM40	Main Name Plate
22	SGYSB28R-KM "Black Type"	Front Panel Ass'y
22	SGYSB28R-SM "Silver Type"	Front Panel Ass'y
23	SHRMSB28R-KM "Black Type"	Operation Chassis Ass'y
23	SHRMSB28R-SM "Silver Type"	Operation Chassis Ass'y
24	SBC735-3 "Black Type"	Reverse Button (A)
24	SBC735-2 "Silver Type"	Reverse Button (A)
25	SBC735-7 "Black Type"	Reverse Button (C)
25	SBC735-6 "Silver Type"	Reverse Button (C)
26	SMN1965	Holder Angle
28	SGX7756-1 "Black Type"	Slide Guide
28	SGX7756 "Silver Type"	Slide Guide
29	SGX7757	Slider (A)
30	SGX7758	Slider (B)
31	SBD121	Timer Knob
32	SBD122	Volume Knob (A)
33	SBD123	Volume Knob (B)
34	SGXSB25-SE1	Cassette Holder Ass'y
34-1	QBP2006A	Tape Pressure Spring
35	SUS796	Holder Spring
36	SBC736	Eject Button
37	SUB236	Eject Lever
38	SMN1971	Eject Spring
39	QYF0627A	Damper Gear Ass'y
41	SUS805	Earth Plate (B)
42	SUSM7	Earth Spring
43	SUS804	Earth Plate (A)
44	QDB0169-1	Tape Counter Belt
45	SMN1969	Connecter Angle
46	STN16	Tape Counter
47	SMN1966	Holder Angle
SCREWS, NUTS & WASHERS		
N 1	XTN3+12B	Tapping Screw ⊕3×12
N 2	XSN3+6S	Screw ⊕3×6
N 3	XTV3+6B	Tapping Screw ⊕3×6
N 4	XTN26+6B	Screw ⊕2.6×6
N 5	XTV3+10BFN	Screw ⊕3×10
N 6	XTN26+8B	Tapping Screw ⊕2.6×8
N 7	XTN3+10B	Screw ⊕3×10
N 8	XTB3+8B	Screw ⊕3×8
N 10	XTS3+8B	Screw ⊕3×8
N 11	QHQ1324K "Black Type"	Screw
N 11	QHQ1324 "Silver Type"	Screw
N 12	XWG3	Washer 3φ
N 13	XWA3B	Washer 3φ
ACCESSORIES		
A 1 [M]	SQFM14	Instruction Book
A 1 [MC]	SQFM16	Instruction Book
A 1 [E] [EGA] [XA]	SQFM17	Instruction Book
A 1 [EK]	SQFM18	Instruction Book
A 1 [EH]	SQFM20	Instruction Book
A 1 [XL]	SQFM19	Instruction Book
A 2 ⚠	SJP9215	AC Plug Adaptor
A 3 [M] [MC] ⚠	SJA170	Power Cord
A 3 [E][EH] [EGA] ⚠	SFDAC05E02	Power Cord
A 3 [EK] ⚠	SFDAC05G02	Power Cord
A 3 [XA] ⚠	SJA168	Power Cord
A 3 [XL] ⚠	SJA173	Power Cord
A 4	SJP2129-5	Connection Cord
PACKINGS		
P 1 [M]	SPGM15	Carton Box
P 1 [MC] [E][EH] [EGA] [XL]	SPGM24 "Silver Type"	Carton Box
P 1 [E][EH] [EGA] [XL]	SPGM25 "Black Type"	Carton Box
P 1 [EK]	SPGM27 "Black Type"	Carton Box
P 1 [EK]	SPGM26 "Silver Type"	Carton Box
P 1 [XA]	SPGM43 "Black Type"	Carton Box
P 1 [XA]	SPGM42 "Silver Type"	Carton Box
P 2	SPSM4	Cushion (R)
P 3	SPSM5	Cushion (L)
P 4	QPC0072	Poly Sheet
P 5	XZB40X60A02	Protection Cover

• Change of Part List (RS-928R from RS-B28R)

Ref. No.	Change of Part No.		Description
	RS-B28R [M][MC] ➡	RS-928R [M][MC]	
CABINET PARTS LOCATION			
19	SYKM9	SYKM9-2	Cassette Lid Ass'y
20	SKC1782S98-1	SKC1782K99-1	Case Cover
21	[M] SGTM17	[M] SGTM38	Main Name Plate
	[MC] SGTM21	[MC] SGTM42	
22	SGYSB28R-SM	SGYSB28R-KM	Front Panel Ass'y
23	SHRMSB28R-SM	SHRMSB28R-KM	Operation Chassis Ass'y
28	SGX7756-1	SGX7756	Slide Guide
SCREW			
N11	QHQ1324	QHQ1324K	Screw
ACCESSORIES			
A1	[M] SQFM14	[M] SQFM15	Instruction Book
	[MC] SQFM16	[MC] SQFM21	
PACKING LIST			
P1	[M] SPGM15	[M] SPGM16	Carton Box
	[MC] SPGM24	[MC] SPGM44	

M MC E EK EGA EH XA XL

Printed in Japan
850512400 Ⓗ M.S

Cassette Deck

DEUTSCH

Verwenden Sie bitte diese Broschüre Zusammen mit der Service-Anieitung für das Modell Nr. RS-B28R.

TECHNISCHE DATEN

System	Stereo-Cassettendeck
Spuren	4 Spuren, 2 Kanäle
Tonköpfe (kombiniert)	
Aufnahme/Wiedergabe	MX-Kopf
Löschen	Ferrit-Kopf mit Doppelspalt
Motoren	1-Motor
Aufnahmesystem	Wechselstrom-Vormagnetisierung
Vormagnetisier ungsfrequenz	80 kHz
Löschsystem	Wechselstrom-Vormagnetisierung
Bandgesch windigkeit	4,8 cm/s
Frequenzgang Reineisenbänder	20 Hz~17.000 Hz 30 Hz~17.000 Hz (DIN) 40 Hz~16.000 Hz±3 dB
CrO_2-Bänder	20 Hz~17.000 Hz 30 Hz~16.000 Hz (DIN) 40 Hz~15.000 Hz±3 dB
Normalbänder	20 Hz~16.000 Hz 30 Hz~15.000 Hz (DIN) 40 Hz~14.000 Hz±3 dB

Geräuschspannungsabstand: (Signalpegel=max. Aussteuerungspegel, CrO_2-Band)

mit Dolby C-Rauschunterdrückung	75 dB (CCIR)
mit Dolby-B-Rauschunterdrückung	67 dB (CCIR)
ohne Rauschunterdrückung	57 dB (nach A bewertet)

Gleichlauschwankungen	0,08% (WRMS) ±0,14% (DIN)
Umspulzeit	ca. 90 s für C-60-Cassette
Eingangsempfindlichkeit und Impedanz	
MIC	0,25 mV/400Ω~10 kΩ
LINE	60 mV/47 kΩ
Ausgangsspannung und Impedanz	
LINE/DIN	400 mV/1,5 kΩ
HEADPHONES	80 mV/8Ω
Stromaufnahme	18 W
Stromversorgung	Netz 50 Hz/60 Hz, 220 V für Europa außer England. 110 V/127 V/220 V/240 V, für andere Länder (voreingestellte Netzspannung 240 V)
Abmessungen (B×H×T)	430×100,5×229,5 mm
Gewicht	3,7 kg

Anm.: Wenn nicht anders vorgeschrieben, Drehschalter und Steuereinrichtungen auf die folgenden Positionen stellen.
- Für saubere Köpfe sorgen.
- Für saubere Tonwelle und Andruckrolle sorgen.
- Auf normale Raumtemperatur achten: 20±5°C (68±9°F)
- Timer-Startschalter: OFF
- Eingangsregler: MAX
- Dolbyschalter: AUS
- Abgleichkontrolle: Mitte (Zentrum)
- Mode Taste: ⟲ mode

MESSUNGEN UND EINSTELL METHODEN

Ⓐ **Senkrechtstellen des Kopfes**	Bedingung: • Wiedergabe (Vorlauf-Rücklauf)	Meßgerät: • Elektronische Voltmeter • Oszillograph • Testband (azimuth) ...QZZCFM • Testband...QZZCRD

Ausgangsbalance-Justierung für linken und rechten Kanal

1. Den Meßaufbau zeigt Fig. 2.
2. In der Forward-Playback Stellung das 8 kHz Signal des QZZCFM Testbandes wiedergeben. Die Azimuth-Schraube (Vorlauf), die Abbildung 3 zeigt, auf maximalen Ausgangspegel des linken und rechten Kanals abgleichen.
   Sind die Ausgangspegel des linken und rechten Kanals nicht gleichzeitig maximal, wie folgt justieren:

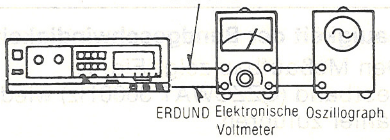


Fig. 2

3. Durch Drehcn der in Abbildung 3 gezeigten Azimuth-Schraube (Vorlauf) die Winkel A und C auffinden (den Punkt wo der Spitzenausgangspegel für den linken, bzw. rechten Kanal erreicht wird, ermitteln). Anschließend den Winkel B zwischen den Winkeln A und C, d.h. den Punkt, wo der Ausgangspegel des linken und rechten Kanals bei maximalem Pegel zusammentreffen, ermitteln. (Siehe Abbildung 3 und 4).
4. In der Reverse Playback Stellung die Azimuth-Schraube (Rücklauf) wie oben beschrieben einstellen.

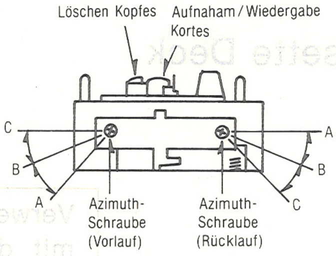

Löschen Kopfes
Aufnaham / Wiedergabe Kortes
C
A
B
B
A
C
Azimuth-Schraube (Vorlauf)
Azimuth-Schraube (Rücklauf)

Fig. 3

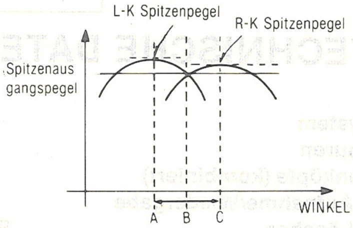


Fig. 4

Phasenjustierung für linken und rechten Kanal

5. Den Meßaufbau zeight Fig. 5.
6. In der Foreward Playback Stellung das 8kHz Signal des Testbandes (QZZCFM) wiedergeben. Die in Abbildung 3 gezeigte Azimuth-Schraube (Vorlauf) so einstellen, daß die Zeiger von zwei Röhrenvoltmetern auf Maximum ausschlagen, und am Oszillographen eine wie in Abbildung 6 gezeigte Wellenform erreicht wird.
7. In der Rücklauf Playback Stellung die Azimuth-Schraube (Rücklauf) wie oben beschrieben einstellen. Prüfung der Pegelabwiechung im Vorwärts-und Rückwärtslauf.
8. Das Playback Pegelsignal (315kHz bei 0dB) auf dem Standerd Playback Meßband wiedergeben und prüfen, daß sich die Pegelabweichung bei Rückwärts-und Vorwärtslauf innerhalb von 1,0dB befindet.
9. Nach der Einstellung die Löschkopfhöhe endgültig festlegen und die Winkel der Einstellungsschrauben bestimmen.

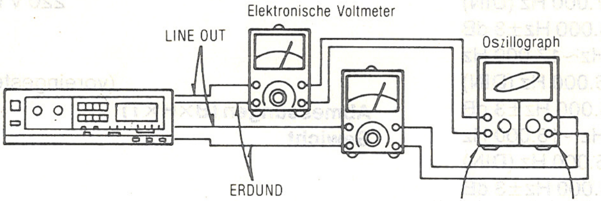

Elektronische Voltmeter
LINE OUT
Oszillograph
ERDUND
Vertikal
Horizontal

Fig. 5

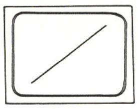
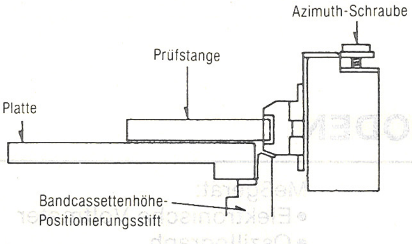


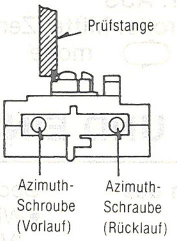
Fig. 6

Tonkopfhöheneinstellung durch Verwendung der Tonkopfeinstellungsschablonc (QZZ0207)

Die Tonkopfeinstellungsschablone erlaubt genaues und schnelles Einstellen der Tonkopfhöhe in folgender Weise.

a. Die Platine in den Mechanismus einlegen.
b. Den Mechanisumus auf Play Stellung schalten.
c Den Prüfungsstift auf die Platine auflegen.
d. Den Prüfungsstift durch jeden Löschkopf stekken.
e. Die Höheneinstellungsschraube so einstellen, daß der Prüfungsstift keinen der Löschköpfe berührt.
f. Testband (Bandverlaufbeobachter QZZCRD) abspielen und darauf achten, daß das Band die Lösch-Köpfe nicht berührt (flattert usw.).
g. Danach die Punkte 1 bis 7 des Einstellungsvorganges durchführen.


Azimuth-Schraube
Prüfstange
Platte
Bandcassettenhöhe-Positionierungsstift


Prüfstange
Azimuth-Schroube (Vorlauf)
Azimuth-Schraube (Rücklauf)

Ⓑ Bandgeschwindigkeit

Bedingung:
- Wiedergabe
- Betriebsart: Normalband

Meßgerät:
- Elektronischer Digitalzähler
- Testband...QZZCWAT

Genauigkeit der Bandgeschwindigkeit

1. Den Meßaufbau zeigt Fig. 7.
2. Testband (QZZCWAT 3000 Hz) wiedergeben und Ausgangssignal dem Zähler zuführen.
3. Frequenz messen.

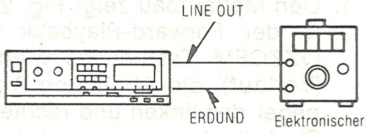

LINE OUT
ERDUND
Elektronischer Digitalzähler

Fig. 7

4. Beträgt die auf dem Testband aufgezeichnete Frequenz 3000 Hz, so ergibt sich die Genauigkeit nach folgender Formel:

$$\text{Genauigkeit der Bandgeschwindigkeit} = \frac{f-3000}{3000} \times 100(\%)$$

worin f die gemessene Frequenz ist.

5. Die Messung soll im mittleren Teil des Bandes erfolgen.

NORMALWERT: 0,33% (3000±10 Hz)

6. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, bitte mit Bandgeschwindigkeitsregler VR wie in Fig. 1 gezeigt einstellen.

Anmerkung: Bitte bei dieser Einheit zum Justieren der Bandgeschwindigkeit keinen Metallschraubenzieher benutzen.

Schwankung der Bandgeschwindigkeit:

Messung, wie oben beschrieben für Anfang, mittleren Teil und Ende des Testbandes wiederholen und Schwankung wie folgt bestimmen:

$$\text{Schwankung} = \frac{f_1-f_2}{3000} \times 100(\%)$$

f_1 = Maximalwert
f_2 = Minimalwert

NORMALWERT: 1,5%

Ⓒ Frequenzgang bei Wiedergabe

Bedingung:
- Wiedergabe (Vorlauf-Rücklauf)
- Betriebsart: Normalband

Meßgerät:
- Elektronische Voltmeter
- Oszillograph
- Testband...QZZCFM

1. Den Meßaufbau zeigt Fig. 2.
2. Gerät auf Wiedergabe schalten. Frequenzgang-Testband QZZCFM wiedergeben.
3. Ausgangsspannung bei 315 Hz, 12,5 kHz, 8 kHz, 1 kHz, 250 Hz, 125 Hz und 63 Hz messen und jede Ausgangsspannung mit der Standardfrequenz 315 Hz an der LINE OUT vergleichen.
4. Messungen an beiden Kanälen durchführen.
5. Prüfen, ob die gemessenen Werte innerhalb des in der Frequenzgang-Übersicht aufgeführten Bereichs liegen. (Siehe Fig. 8.)

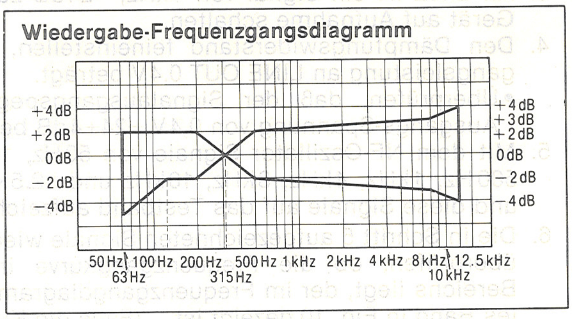


Fig. 8

Ⓓ Wiedergabe-Verstärkung

Bedingung:
- Wiedergabe (Vorlauf-Rücklauf)
- Betriebsart: Normalband

Meßgerät:
- Elektronische Voltmeter
- Oszillograph
- Testband...QZZCFM

1. Den meßaufbau zeigt Fig. 2.
2. Den Standard-Aufnahmepegelteil der Testbandcassette (QZZCFM, 315 Hz) wiedergeben und mit dem Elektronische Voltmeter den Ausgangspegel an den LINE OUT-Anschlüssen messen.
3. Messung an beiden Kanälen durchführen.

NORMALWERT: 0,4V±0,05V

Einstellung:

1. Abweichungen können durch Abgleich von VR1 (linker Kanal) und VR2 (rechter Kanal), korrigiert werden.
2. Nach erfolgtem Abgleich ist der Frequenzgang bei Wiedergabe erneut zu kontrollieren.

Ⓔ Löschstrom

Bedingung:
- Aufnahme
- Betriebsart: Metallband

Meßgerät:
- Elektronische Voltmeter
- Oszillograph
- Testband (Leerband) ...QZZCRZ für Metall

1. Den Meßaufbau zeigt Fig. 9.
2. Die Aufnahme-und Pausentaste drücken.
3. Den Bandwahlschalter auf Metallband-Position stellen.
4. Löschstrom nach folgender Formel emitteln:

$$\text{Löschstrom (A)} = \frac{\text{Die Spannung über beide Enden von R201}}{\text{1 (Ohm)}}$$

NORMALWERT: 190 $^{+10}_{-15}$ mA (Metal position) (190 $^{+10}_{-15}$ mV)

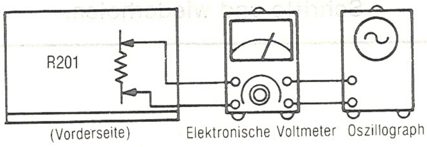


Fig. 9

5. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, auf folgenden Weise einstellen.

Einstellung:

- Beträgt der Löschstrom mehr als 200mA, unterbrechen Sie den Schaltdraht.

Ⓕ **Gesamtfrequenzgang**	Bedingung: • Aufnahme und Wiedergabe • Betriebsart "Normalband" • Betriebsart "CrO_2 Band" • Betriebsart "Metallband" • Eingangsregler...MAX	Meßgerät: • Elektronische Voltmeter • NF-Generator • Abschwächer • Oszillograph • Testband (Leerband) ...QZZCRA für Normal ...QZZCRX für CrO_2 ...QZZCRZ für Metall • Widerstand (600Ω)

Anm.:

Vor Messung und Abgleich des Gesamtfrequenzganges ist sicherzustellen, daß der Frequenzgang bei Wiedergabe korrekt ist (Vgl. entspr. Abschnitt).

Gesamtfrequenzgang-Justierung durch Aufnahme-Vomagnetisierungsstrom

(Der Aufnahme-Entzerrer ist fest eingestellt.)

1. Den Meßaufbau zeigt Fig. 11.
2. Gerät auf Betriebsart "Normalband" schalten, und Testband (QZZCRA) einlegen.
3. An LINE IN ein Signal von 1kHz, −24dB zuführen. Das Gerät auf Aufnahme schalten.
4. Den Dämpfungswiderstand feineinstellen, bis die Ausgangsleistung an LINE OUT 0,4V beträgt.
   - Überprüfen, daß der Signalausgangspegel bei einer Ausgangs-Spannung von 0,4V −24±4dB beträgt.
5. Mit dem NF-Oszillator Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz und 12.5kHz zuführen, und diese Signale auf das Testband aufzeichnen.
6. Die in Schritt 5 aufgezeichneten Signale wiedergeben und überprüfen, ob die Frequenzgangkurve innerhalb des Bereichs liegt, der im Frequenzgangdiagramm für normales Band in Fig. 10 gezeigt ist. (Falls die Kurve innerhalb des vorgeschriebenen Bereichs liegt, mit den Schritten 7, 8 und 9 weiterfahren.)
   Falls die Kurve außerhalb des vorgeschriebenen Bereichs liegt, wie folgt justieren.

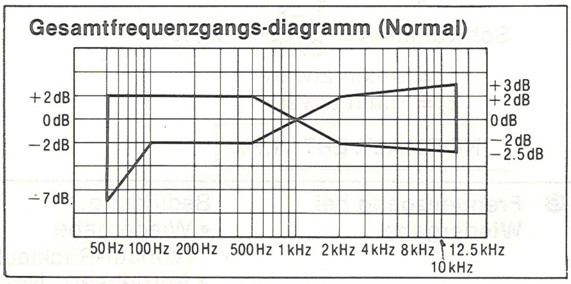

Gesamtfrequenzgangs-diagramm (Normal)

Fig. 10

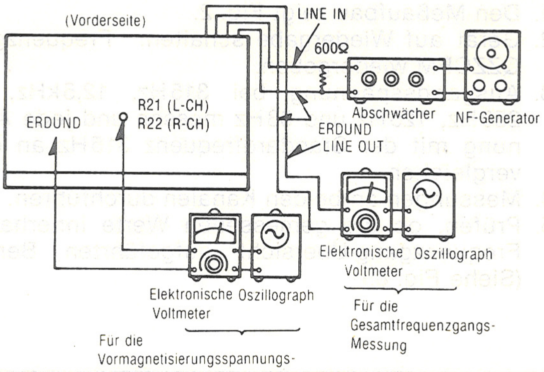


Fig. 11

Justierung (A):

Wenn die Kurve den vorgeschriebenen Gesamtfrequenzgangbereich (Fig. 10) überschreitet, wie in Fig. 12 gezeigt.

1) Den Votmagnetisierungsstrom durch Abgleichen von VR201 (linker Kanal) und VR202 (rechter Kanal) erhöhen.
2) Die Schritte 5 und 6 zur Überprüfung wiederholen. (Wenn die Kurve dabei innerhalb des vorgeschriebenen Bereichs liegt (Fig. 10) mit den Schritten 7, 8, und 9 weiterfahren.)
3) Wenn die Kurve den vorgeschriebenen Bereich (Fig. 10) noch immer überschreitet, den Vormagnetisierungsstrom weiter erhöhen, und die Schritte und wiederholen.

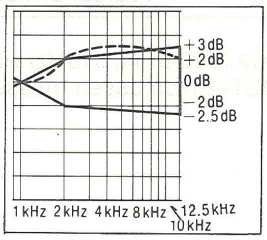


Fig. 12

Justierung (B):

Wenn die Kurve unter den vorgeschriebenen Bereich für den Gesamtfrequenzgang (Fig. 10) absinkt, wie in Fig. 13 gezeigt:

1) Den Vormagnetisierungsstrom durch abgleichen von VR201 (linker Kanal) und VR202 (rechter Kanal) reduzieren.
2) Die Schritte 5 und 6 zur Überprüfung wiederholen. (Falls die Kurve dabei innerhalb des vorgeschriebenen Bereichs in Fig. 10 liegt, mit den Schritten 7, 8, und 9 weiterfahren.)
3) Falls die Kurve noch immer unter den vorgeschriebenen Bereich (Fig. 10) absinkt, den Vormagnetisierungsstrom weiter reduzieren, und Schritte 5 und 6 wiederholen.

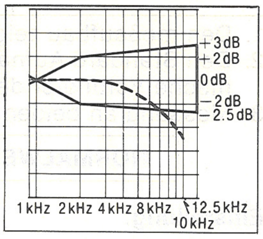


Fig. 13

7. Gerät auf Betriebsart "CrO₂ Band" schalten.
8. Testband QZZCRX einlegen, und Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz und 14kHz aufzeichnen; Anschliessend die Signale wiedergeben und prüfen, ob die Kurve innerhalb des Bereichs liegt, der im Gesammtfrequenzgang-Diagramm für das CrO₂ Band dargestellt ist. (Fig. 14.)
9. Gerät auf Betriebsart "Metallband" schalten. Testband QZZCRZ einlegen und Signale von 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz und 14kHz aufnehmen. Anschließend die Signale wiedergeben und prüfen, ob die Kurve innerhalb des Bereichs im Gesamtfrequenzgangdiagramm für Metallband liegt. (Fig. 14.)
10. Überprüfen, daß die Vorspannung ungefähr den folgenden Werten entsprechen, wenn der Bandsortenschalter in die entsprechende Position gestellt ist.

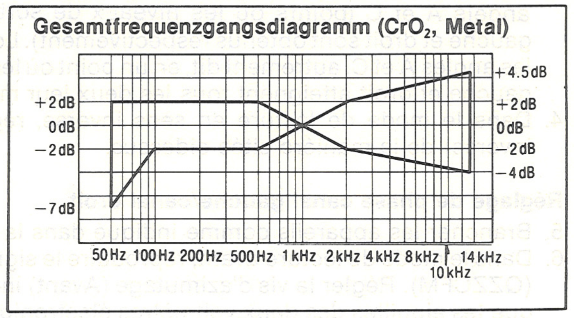


Fig. 14

- Die spannung an den Anschlüssen des Widerstandes R21 (linker Kanal) [R22 (rechter Kanal)] ablesen und den Vormagnetisierungsstrom entsprechend folgender Formel berechnen.

$$\text{Vormagnetisierungsstrom (A)} = \frac{\text{Spannung am Röhrenvoltmeter (V)}}{10\ (\Omega)}$$

Ungefähr 420μA (Normal position)
Bezugswert: Ungefähr 560μA (CrO₂ position)
Ungefähr 900μA (Metall position)

Ⓖ Gesamtverstärkung

Bedingung:
- Aufnahme und Wiedergabe
- Betriebsart: Normalband
- Eingangsregler: MAX
- Standard-Eingangspegel:
  - Mikrofon ....-72^{+5}_{-3}dB (0,25mV)
  - NF-Eingang......−24±4dB (60mV)

Meßgerät:
- Elektronische Voltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Widerstand (600Ω)
- Testband (Leerband) ...QZZCRA für Normal

1. Den Meßaufbau zeigt Fig. 15.
2. Normales Testleerband (QZZCRA) einlegen.
3. Gerät auf "Aufnahme" schalten.
4. Über den Abschwächer ein 1kHz-Signal (−24dB) vom NF-Generator dem NF-Eingang zuführen.
5. ATT justieren, bis der Monitorpegel an den LINE OUT-Anschlüssen 0,4±0,05V beträgt.
6. Eine bespielte Cassette wiedergeben und überprüfen, ob der Ausgangspegel an den LINE OUT-Anschlüssen 0,4±0,05V beträgt.
7. Wenn der gemessene Wert nicht 0,4±0,05V erreicht, die folgenden VR abgleichen: VR7 (L-K) oder VR8 (R-K).
8. Ab Punkt 2 wiederholen.

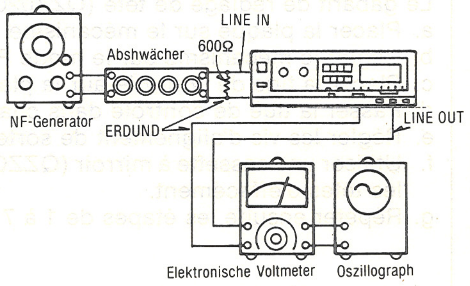


Fig. 15

Ⓗ Fluoreszenzmeter

Bedingung:
- Aufnahme
- Eingangsregler...MAX.

Meßgerät:
- Elektronische Voltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Widerstand (600Ω)

1. Der MeBaufbau zeigt Fig. 15.
2. Die Einheit auf Aufnahmestellung schalten.
3. Ein 1kHz Signal (−24dB) vom AF Oszillator durch "ATT" auf "LINE IN" goben.
4. ATT so justieren, daß an "LINE OUT" 0,4V anliegen.
5. Versichern Sie sich, ob die Pegelanzeige LED "0" aufleuchtet sobald 0,4V±1dB (0,05V) auf "LINE OUT" gegeben werden.

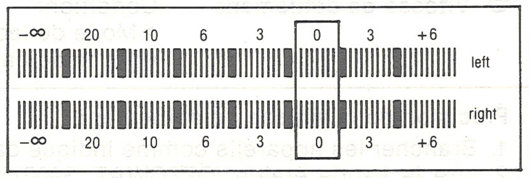


Fig. 16

Ⓘ Dolby-Schaltung

Bedingung:
- Aufnahme
- Dolby-Schalter ...IN/OUT (AN/AUS)
- Dolby-Wahlschalter ...B/C
- Eingangsregler...MAX.

Meßgerät:
- Elektronische Voltmeter
- NF-Generator
- Abschwächer
- Oszillograph
- Widerstand (600Ω)

Aufnahmeseite

- Überprüfung der Dolby-B-Typ Verschlüsselungsmerkmale.

1. Den Meßaufbau zeigt Fig. 17.
2. Gerät auf "Aufnahme" stellen. (Dolby-Wahlschalter ist OUT (AUS).)
3. Dem NF-Eingang ein 1kHz-Signal zuführen.
4. Abschwächer so abstimmen, daß die Ausgangsspannung an Nadel 7 von IC3 (L-K) und IC4 (R-K) 12,3mV beträgt.
5. Die Ausgangsspannung an Nadel 21 sollte 0dB betragen (375mV).
6. Den Dolby-Wahlschalter auf B stellen. Sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +6dB±2dB beträgt (760mV).
7. Dolby-Wahlschalter ausschalten und die Frequenz auf 5kHz abstimmen. Das Ausgangssignal an Nadel 21 sollte 0dB betragen (375mV).
8. Dolby-Wahlschalter auf B stellen und sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +8dB±2dB beträgt (960mV).

- Überprüfung der Dolby-C-Typ Verschlüsselungsmerkmale

9. Obige Stufen 1 bis 5 wiederholen.
10. Dolby-Wahlschalter auf C stellen und sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +11,5dB±2dB beträgt (1,5V).
11. Dolby-Wahlschalter ausschalten und die Frequenz auf 5kHz abstimmen. Die Ausgangsspannung an Nadel 21 sollte 0dB sen (375mV).
12. Dolby-Wahlschalter auf C stellen und sicherstellen, daß das Ausgangssignalpegel an Nadel 21 von IC3 (L-K) und IC4 (R-K) +8,5dB±2dB beträgt (980mV).

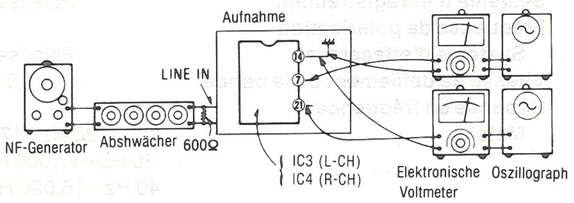


Fig. 17

FRANÇAIS

Ceci est à utiliser conjointement avec le manuel d'entretien du modèle No. RS-B28R.

■ CARACTERISTIQUES

Platine	Platine magnéto-cassette stéréo
Pistes	4 pistes, 2 canaux
Têtes (combinaison)	
ENREGISTREMENT/LECTURE	Tête en MX
Effacement	Tête en ferrite à double entrefer
Moteur	1-moteur
Système d'enregistrement	Polarisation CA
Fréquence de polarisation	80 kHz
Système d'effacement	Polarisation CA
Vitesse de défilement de la bande	4,8 cm/sec.
Réponse en fréquence	
Métal	20 Hz~17.000 Hz 30 Hz~17.000 Hz (DIN) 40 Hz~16.000 Hz±3 dB
CrO₂	20 Hz~17.000 Hz 30 Hz~16.000 Hz (DIN) 40 Hz~15.000 Hz±3 dB
Normal	20 Hz~16.000 Hz 30 Hz~15.000 Hz (DIN) 40 Hz~14.000 Hz±3 dB
Rapport signal/bruit: (niveau de signal=niveau d'enregistrement maximum, bande magnétique de type CrO₂)	
Système de réduction de bruits Dolby C	75 dB (CCIR)
Système de réduction de bruits Dolby B	67 dB (CCIR)
Pas de système de réduction de bruits	57 dB (A pondéré)

Pleurage et scintillement	0,08% (WRMS) ±0,14% (DIN)
Temps d'avance rapide et de rebobinage	Environ 90 secondes pour une cassette C-60
Sensibilité et impédance d'entrée	
MICROPHONE	0,25 mV/400Ω~10 kΩ
LIGNE	60 mV/47 kΩ
Tension et impédance de sortie	
LIGNE	400 mV/1,5 kΩ
CASQUE D'ECOUTE	80 mV/8Ω
Consommation	18 W
Alimentation	AC 50 Hz/60 Hz 220 V pour l'Europe sauf le Royaume-Unis, 110 V/127 V/220 V/240 V, tension d'alimentation préréglée 240 V pour les autres régions
Dimensions (L×H×P)	430×100,5×229,5 mm
Poids	3,7 kg

REMARQUES: Placer les interrupteurs et les contrôles dans les positions suivantes, sauf indication contraire.

- Vérifier que les têtes soient propres.
- Vérifier que le cabestan et le galet presseur soient propres.
- Température ambiante admissible: 20±5°C
- Interrupteur de démarrage de la minuterie: OFF
- Contrôles de niveau d'entrée: Maximum
- Interrupteur de réduction de bruit: OUT
- Contrôle de l'équilibre: Centre
- Commande de mode: ↻ mode

■ METHODES DES MEASURES ET REGLAGES

Ⓐ **Réglage de l'azimut de tête**	Condition: • Mode de lecture (En avant • En sens inverse)	Equipement: • Voltmètre électronique • Oscilloscope • Bande étalon (azimut) ...QZZCFM • Bande étalon...QZZCRD

Réglage de l'équilibre de la sortie au canal gauche/canal droit

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Dans le mode de lecture avant, reproduire le signal de 8kHz de la bande étalon (QZZCFM).
   Régler la vis d'azimutage (Avant) indiquée dan la Fig. 3 pour obtenir les niveaux de sortie maximum pour les canaux gauche et droit.
   Lorsque les niveaux de sortie des canaux gauche et droit ne sont pas simultanément à leur maximum, les régler à nouveau de la façon suivante.

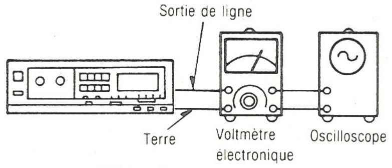


Fig. 2

3. Tourner la vis d'azimutage (Avant) indiquée dan la Fig. 3 pour obtenir les angels A et C (points où les niveaux de sortie de créte pour les canaux gauche et droit sont obtenus respectivement). Localiser ensuite l'angle B entre les angles A et C, autrement dit, en un point où les niveaux de sortie des canaux gauche et droit atteignent tous les deux leur maximum. (Voir les Fig. 3 et 4.)
4. Dans le mode de lecture en sens inverse, régler la vis d'azimutage (sens inverse) de la maniére citée cidessus.

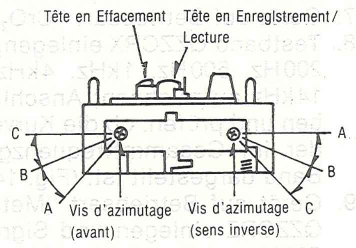

Tête en Effacement
Tête en Enregistrement/Lecture
C
A
B
B
A
C
Vis d'azimutage (avant)
Vis d'azimutage (sens inverse)

Fig. 3

Réglage de phase canal gauche/canal droit

5. Brancher les appareils comme indiqué dans la Fig. 5.
6. Dans le mode de lecture avant, reproduire le signal de 8kHz de la bande étalon (QZZCFM). Régler la vis d'azimutage (Avant) indiquée dans la Fig. 3, de aorte que les aiguilles des deux voltmètres électroniques oscillent au maximum, et qu'on obtienne sur l'oscilloscope une forme d'onde semblable à celle indiquée dans la Fig. 6.
7. Dans le mode de lecture en sens inverse, régler la vis d'azimutage (sens inverse) de la manière citée cidessus. Vérification de la différence de niveau entre les modes de lecture en avant et en sens inverse.

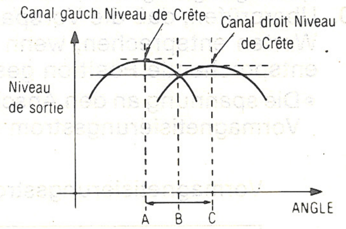


Fig. 4

8. Reproduire le signal de 8kHz (315Hz à 0dB) de la Cassette étalon standard, et vérifier que la différence de niveau entre les modes de lecture avant et lecture inverse ne dépasse pas 1 dB.
9. Après réglage, immobiliser les vis de réglage de la tête d'effacement et de réglage d'angle.

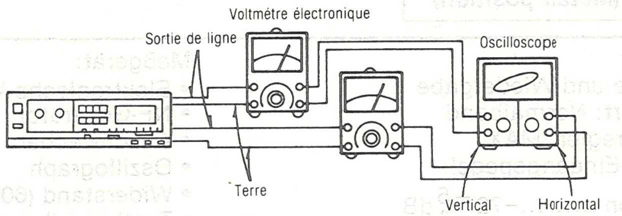


Fig. 5

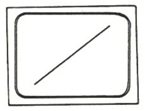
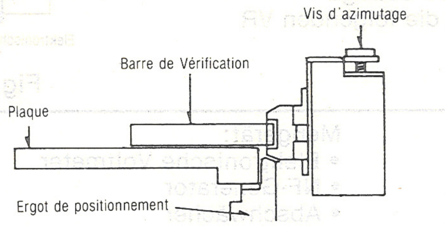


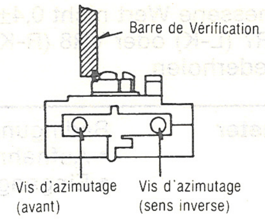
Fig. 6

Réglage de l'alignement à l'aide du gabarit de réglage (QZZ0207)

Le gabarit de réglage de tête (QZZ0207) permet un réglage rapide et précis de l'alignement:

a. Placer la plaque sur le mécanisme.
b. Régler le mécanisme sur le mode PLAY.
c. Placer la tige de contrôle aur la plaque.
d. Passer la tige de contrôle dans chaque tête d'effacement.
e. Régler les vis d'alignement de sorte que la tige de contrôle ne touche aucune des têtes d'effacement.
f. Utiliser une cassette à mirroir (QZZCRD) pour vérifier que le ruban ne touche pas (ne s'enroule pas autour) les têtes d'effacement.
g. Répéter ensuite les étapes de 1 à 7 de la procédure de réglage.





Ⓑ **Vitesse de défilement**	Condition: • Mode de lecture • Mode de bande normale	Equipement: • Fréquencemètre numérique • Bande étalon...QZZCWAT

Précision de la vitesse de défilement

1. Brancher les appareils comme indiqué dans la Fig. 7.
2. Lire la bande étalon (QZZCWAT, 3000Hz) et appliquer le signal de lecture au fréquencemètre numérique.
3. Mesurer sa fréquence.
4. Sur la base de 3000Hz, déterminer la valeur à l'aide de la formule.

$$\text{Précision de vitesse} = \frac{f-3000}{3000} \times 100(\%)$$

avec f = valeur mesurée.

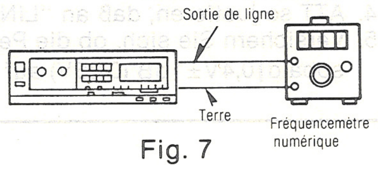


Fig. 7

4. Sur la base de 3000 Hz, déterminer la valeur à l'aide de la formule.

$$\text{Précision de vitesse} = \frac{f-3000}{3000} \times 100(\%)$$

avec f = valeur mesurée.

5. Effectuer la mesure sur la partie médiane de la bande.

Valeur standard: 0,33% (3000±10 Hz)

6. Si la valeur mesurée ne correspond pas à la valeur standard, régler au moyen de la vis VR de réglage de la vitesse de défilement indiquée dans la Fig. 1.
   Remarque: Utiliser un tournevis qui ne soit pas métallique pour le réglage de la précision de la vitesse de défilement sur cette unité.

Fluctuations de vitesse de défilement

Faire les mesures de la même façon que ci-dessus (au début, au milieu et en fin de bande) et déterminer la différence entre les valeurs maximale et minimale, puis calculer comme suit.

$$\text{Fluctuations de vitesse} = \frac{f_1-f_2}{3000} \times 100(\%)$$

f_1 = valeur maximale
f_2 = valeur minimale

Valeur standard: 1,5%

Ⓒ Réponse en fréquence à la lecture

Condition:
- Mode de lecture
  (En-avant • En sens inverse)
- Mode de bande normale

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon ...QZZCFM

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Lire la portion de réponse en fréquence de la bande étalon (QZZCFM).
3. Mesurer les niveaux de sortie à 315 Hz, 12,5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz, et 63 Hz et comparer chaque niveau de sortie avec celui de la fréquence standard de 315 Hz sur la borne LINE OUT.
4. Effectuer les mesures sur les deux canaux.
5. Vérifier que les valeurs mesurées se situent dans la bande spécifiée de la courbe de réponse en fréquence. (Voir Fig. 8).

Tableau de lecture des réponses en fréquence

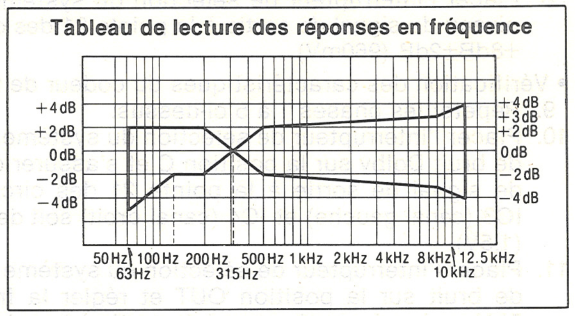


Fig. 8

Ⓓ Gain à la lecture

Condition:
- Mode de lecture
  (En-avant • En sens inverse)
- Mode de bande normale

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon...QZZCFM

1. Brancher les appareils comme indiqué dans la Fig. 2.
2. Faire jouer la portion du niveau d'enregistrement normal sur la bande d'essai (QZZCFM, 315 Hz) et, en utilisant un voltmètre électronique, mesurer le niveau de sortie aux sorties en ligne.
3. Effectuer les mesures sur les deux canaux.

Valeur standard: 0,4V±0,05V

Réglage

1. Si la valeur mesurée ne correspond pas à la valeur standard régler VR1 (canal gauche) ou VR2 (canal droit).
2. Après réglage, vérifier à nouveau la "réponse en fréquence à la lecture".

Ⓔ Courant d'effacement

Condition:
- Mode d'enregistrement
- Mode de bande métallique

Equipement:
- Voltmètre électronique
- Oscilloscope
- Bande étalon Vierge
  ...QZZCRZ pour bande métallique

1. Brancher les appareils comme indiqué dans la Fig. 9.
2. Placer l'UNITE sur le mode de bande métallique.
3. Appuyer sur les boutons d'enregistrement et de pause.
4. Lire le voltage sur le voltmètre électronique et calculer le courant d'effacement au moyen de la formule suivante:

$$\text{Courant d'effacement (A)} = \frac{\text{Voltage à la résistance R201}}{1\ (\Omega)}$$

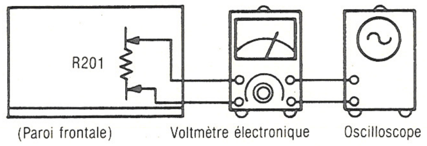


Fig. 9

Valeur standard: 190^{+10}_{-15} mA (bande métallique) (190^{+10}_{-15} mV)

5. Si la valeur mesurée ne correspond pas à la valeur standard, régler selon les instructions ci-après.

Réglage

- Si le courant d'effacement est supérieur à 200mA, couper le fil de connection.

Ⓕ Réponse de fréquence globale

Condition:
- Mode enregistrement/lecture
- Mode de bande normale
- Mode de bande CrO_2
- Mode de bande métallique
- Contrôles de niveau d'entrée...MAX

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscillateur
- Oscilloscope
- Résistance (600Ω)
- Bande étalon vierge
  ...QZZCRA pour bande normale
  ...QZZCRX pour bande CrO_2
  ...QZZCRZ pour bande métallique

Remarque:

Avant de mesurer et régler la réponse de fréquence globale vérifier que la réponse en fréquence à la lecture soit correcte (pout la méthode de mesure, se reporter au paragraphe intitulé "Réponse en fréquence à la lecture").
(Le compensateur d'enregistrement est fixe.)

1. Brancher les appareils comme indiqué dans la Fig. 11.
2. Placer l'UNITE en mode pour bande normale, et introduire la bande étalon vierge normale (QZZCRA).
3. Appliquer le signal de 1 kHz de l'oscillateur AF à la borne LINE IN, par l'intermédiaire de l'atténuateur.
4. Régler l'atténuateur de sorte que le niveau d'entrée soit de 20 dB en-dessous du niveau d'enregistrement standard (niveau d'enregistrement standard = 0 VU).
5. Régler l'oscillateur AF pour produire des signaux de 50 Hz 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz et 12,5 kHz et enregistrer ces signaux sur la bande étalon.
6. Reproduire les signaux enregistrés dans la phase 6, et vérifier si la courbe de réponse de fréquence se trouve dans les limites indiquées par la courbe de réponse de fréquence globale pour bandes normales (Fig. 10).
   (Si la courbe est comprise dans les spécifications, passer aux phases 7, 8 et 9).
   Si la courbe ne correspond pas aux spécifications du tableau, régler comme suit.

Tableau de l'ensemble des réponses en fréquence (Normal)

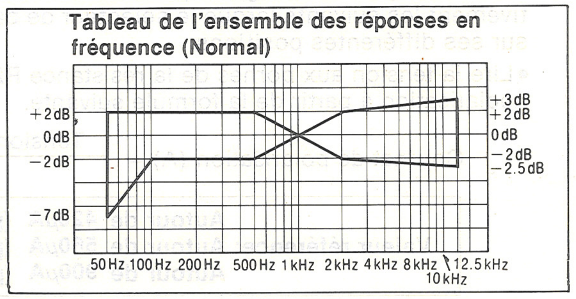


Fig. 10

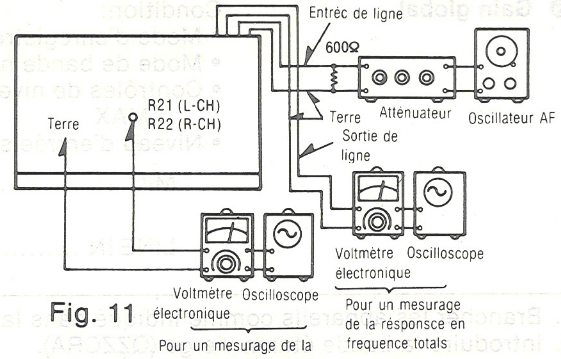


Fig. 11

Réglage (A):

Lorsque la courbe dépasse les spécifications du tableau de réponse de fréquence globale (Fig. 10), comme indiqué dans la Fig. 12.

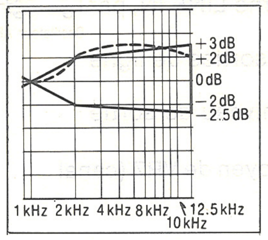


Fig. 12

1) Augmenter le courant de polarisation en tournant VR201 (canal gauche) et VR202 (canal droit).
2) Répéter les phases 5 et 6 pour confirmation. (Passer aux phases 7, 8 et 9 si la courbe est maintenant comprise dans les spécifications du tableau de la Fig. 10).
3) Si la courbe dépasse encore les spécifications (Fig. 10), augmenter encore le courant de polarisation et répéter les phases 5 et 6.

Réglage (B):

Lorsque la courbe tombe au-dessous des spécifications du tableau de fréquence globale (Fig. 10) comme indiqué dans la Fig. 13.

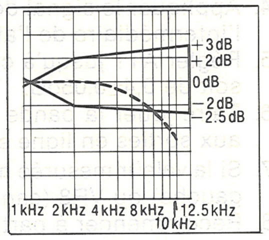


Fig. 13

1) Réduire le courant de polarisation en tournant VR201 (canal gauche) et VR202 (canal droit).
2) Répéter les phases 5 et 6 pour confirmation. (Passer aux phases 7, 8 et 9 si la courbe est maintenant comprise dans les spécifications du tableau de la Fig. 10).
5) Si la courbe tombe encore au-dessous des spécifications du tableau (Fig. 10), réduire encore le courant de polarisation et répéter les phases 5 et 6.

7. Placer l'UNITE en mode de bande CrO_2.
8. Enlever la bande étalon vierge normale et placer la bande étalon QZZCRX (bande CrO_2). Enregistrer les signaux de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz et 14kHz. Reproduire ensuite ces signaux et vérifier si la courbe est comprise dans les limites indiquées par le tableau de réponse de fréquence globale pour les bandes CrO_2 (Fig. 14).
9. Placer l'UNITE en mode de bande métallique, changer la bande étalon pour la bande étalon vierge QZZCRZ (bande métallique), et enregistrer les signaux de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz et 14kHz. Ensuite, lire les signaux et vérifier si la courbe se trouve entre les limites indiquées dans le tableau de réponse en fréquence globale pour les ruban CrO_2 (Fig. 14).
10. Confirmer que les voltage de polarisation sont approximativement les suivants lorque le sélecteur de bande est mis sur ses différentes positions.

Tableau de l'ensemble das réponses en fréquence (CrO_2, Metal)

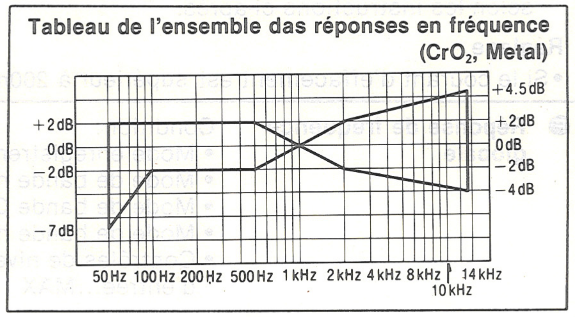


Fig. 14

- Lire la tension aux bornes de la rèsistance R21 (canal gauche) [R22 (canal droit)], et calculer le courant de polarisation á partir de la formule suivante.

$$\text{Cournat de polarisation (A)} = \frac{\text{Tension lue sur voltm.élec. (V)}}{10\ (\Omega)}$$

Valeur référence: Autour de 420μA (position: Normal)
Autour de 560μA (position: CrO_2)
Autour de 900μA (position: Metal)

Ⓖ Gain global

Condition:
- Mode d'enregistrement/lecture
- Mode de bande normale
- Contrôles de niveau d'entrée ...MAX
- Niveau d'entrée standard:

MIC ....-72^{+5}_{-3}dB (0,25mV)
LINE IN ....−24±4dB (60mV)

Equipement:
- Voltmètre électronique
- Oscillateur AF
- Atténuateur
- Oscilloscope
- Résistance (600Ω)
- Bande étalon vierge...QZZCRA pour bande normale

1. Brancher les appareils comme indiqué dans la Fig. 15.
2. Introduire la bande étalon vierge (QZZCRA).
3. Placer l'UNITE en mode d'enregistrement.
4. Appliquer le signal de 1kHz de l'oscillateur AF à la borne LINE IN, par l'intermédiaire de l'atténuateur (−24dB).
5. Régler ATT jusqu'à ce que le niveau du moniteur aux sorties de ligne soit de 0,4±0,05dB.
6. Faire jouer la bande enregistrée et s'assurer que le niveau de sortie aux sorties en ligne soit de 0,4±0,05V.
7. Si la valeur mesurée n'est pas de 0,4±0,05V, régler au moyen de VR7 (canal gauche) ou VR8 (canal droit).
8. Recommencer à partir de la phase (2).

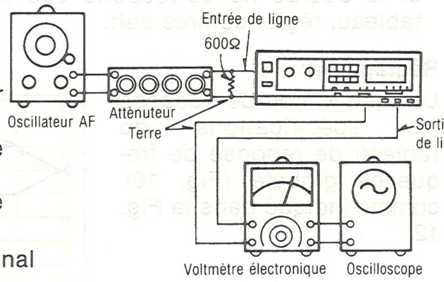


Fig. 15

Ⓗ Vumètre de niveau

Condition:
- Mode d'enregistrement
- Contrôles de niveau d'entrée ...MAX

Equipement:
- Voltmètre électronique
- Atténuateur
- Oscillateur AF
- Oscilloscope
- Résistance (600Ω)

1. Brancher les appareils comme indiqué dans la Fig. 15.
2. Placer l'appareil sur le mode d'enregistrement.
3. Transmettre un signal de 1kHz (−24dB) à partir de l'oscillateur d'audiofréquence par l'atténuateur LINE IN.
4. Régler l'atténuateur jusqu'à ce que le niveau de contrôle à LINE OUT atteigne 0,4V.
5. Vérifier que le vu mètre à LED indique "0" lorsque LINE OUT est 0,4V±1dB. (0.05V)

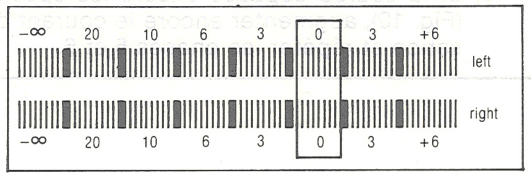


Fig. 16

Ⓘ Circuit de réduction de bruit Dolby

Condition:
- Mode d'enregistrement
- Interrupteur de réduction de bruit Dolby...IN/OUT
- Interrupteur de sélection du système de réduction de bruit Dolby...B/C
- Contrôles de niveau d'entrée...MAX
- Contrôle de l'équilibre ...Centre

Equipement:
- Voltmètre électronique
- Oscillateur AF
- Atténuateur
- Oscilloscope
- Résistance (600Ω)

Côté enregistrement

- Vérification des caractéristiques du codeur de type Dolby-B

1. Brancher les appareils comme indiqué dans la Fig. 17.
2. Placer l'unité sur le mode d'enregistrement. (L'interrupteur de sélection du système de réduction de bruit est sur la position OUT).
3. Appliquer un signal de 1kHz à la borne LINE IN.
4. Régler l'atténuateur de sorte que le niveau de sortie á la points 7 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de 12,3mV. (375mV).
5. Le niveau de sortie à la pointe 21 devrait être de 0dB.
6. Placer l'interrupteur de sélection du système de réduction de bruit sur B et s'assurer que le niveau du signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) est de +6dB±2dB (760mV). (760mV).
7. Placer l'interrupteur de sélection du système de réduction de bruit sur la position OUT et régler la fréquence sur 5kHz. Le niveau du signal de sortie à la pointe 21 devrait être de 0dB (375mV).
8. Placer l'interrupteur de sélection du système de réduction de bruit sur la position B et s'assurer que le niveau du signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de +8dB±2dB (960mV).

- Vérification des caractéristiques du codeur de type Dolby-C

9. Répéter les phases 1 à 5 ci-dessus.
10. Placer l'interrupteur de sélection du système de réduction de bruit Dolby sur la position C et s'assurer que le niveau de signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de 11,5dB±2dB (1,5V).
11. Placer l'interrupteur de sélection du système de réduction de bruit sur la position OUT et régler la fréquence sur 5kHz. Le niveau du signal de sortie à la pointe 21 devrait être de 0dB (375mV).
12. Placer l'interrupteur de sélection du système de réduction de bruit sur la position C et s'assurer que le niveau du signal de sortie à la pointe 21 des circuits intégrés IC3 (canal gauche) et IC4 (canal droit) soit de +8,5dB±2dB (980mV).

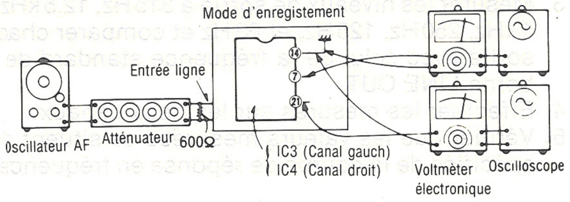


Fig. 17

ESPAÑOL

Sirvase utilizarse junto con manual de servicio para el model No. RS-B28R.

■ ESPECIFICACIONES TECNICAS

Sistema de platina	Platina de a cassette estéreo
Sistema de pistas	4 pistas, 2 canales
Cabeza (combinación)	
de GRAB/REPROD	Cabeza de MX
de borrado	Cabeza de ferrita de 3 entrehierros
Motor	1 motor
Sistema de grabación	Polarización de CA
Frecuencia de polarización	80 kHz
Sistema de borrado	Polarización de CA
Velocidad de cinta	4,8 cm/seg.
Respuesta de frecuencia	
Metal	20 Hz~17.000 Hz 30 Hz~17.000 Hz (DIN) 40 Hz~16.000 Hz±3 dB
CrO₂	20 Hz~17.000 Hz 30 Hz~16.000 Hz (DIN) 40 Hz~15.000 Hz ±3 dB
Normal	20 Hz~16.000 Hz 30 Hz~15.000 Hz (DIN) 40 Hz~14.000 Hz±3 dB
Señal a ruido: (niveau de señal=niveal de grabación máx. tipo de cinta CrO₂)	
con reducción de ruidos Dolby C	75 dB (CCIR)
con reduccón de ruidos Dolby B	67 dB (CCIR)
sin reducción de ruidos	57 dB (promedio A)
Variación de velocidad	0,08% (WRMS) ±0,14% (DIN)
Tiempo de avance rápido y rebobinado	Approx. 90 segundos con cintas C-60
Sensibilidad de entrada e impedancia	
MIC	0,25 mV/400Ω~10 kΩ
LINE	60 mV/47 kΩ
Voltaje de salida e impedancia	
LINE	400 mV/1,5 kΩ
HEADPHONE	80 mV/8Ω
Consumo de corriente	18 W
Alimentación de energía	CA de 50/60 Hz, 220 V para Europe except el Reino Unido, 110 V/127 V/220 V/240 V, voltage prefijado a 240 V en las demás regiones
Dimensions (An.×Al×Prof.)	430×100,5×229,5 mm
Peso	3,7 kg

NOTAS: Colocar los interruptores y controles en las posiciones siguientes a no ser que se especifique lo contrario:
- Asegurarse de que las cabezas estén limpias.
- Asegurarse de que los cabrestantes y los rodillos presores estén limpios.
- Temperatura ambiente aconsejable: 20±5°C (68±9°F)
- Interruptor de comienzo de temporizador: OFF
- Controles del nivel de entrada: Máximo
- Interruptor NR (de reducción de ruido): OUT
- Interruptor de mode: ⊂⊃ mode
- Control del balance : Centro

■ METODOS DE AJUSTTE Y MEDIDA

Ⓐ Ajuste de azimut de las cabezas

Condición:
- Modo de reproducción (En avance • En retroceso)

Equipo:
- (EVM) Voltimetro electrónico
- Oscilloscopio
- Cinta de prueba (azimut) ...QZZCFM
- Cinta de prueba...QZZCRD

Ajuste del equilibrio de salida L-CH/R-CH (canal izquierdo/canal derecho)

1. Efectuar las conexiones como muestra la Fig.2.
2. En el modo de reproducción en avance, reproducir la señal de 8kHz desde la cinta de prueba (QZZCFM). Ajustar el tornillo del azimut (en avance) mostrado en la Fig. 3 para conseguir los máximos niveles de salida L-CH y R-CH. Cuando los niveles de salida de L-CH y R-CH no están al máximo, al mismo tiempo, reajustar de la siguiente forma:

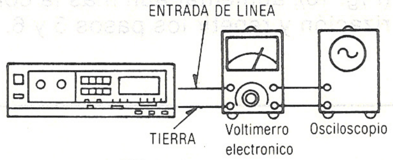


Fig. 2

3. Girar el tornillo del azimut (en avance) mostrado en la Fig. 3 para encontrar los ángulos A y C (puntos en los que se obtienen los niveles de salida en cresta para los canales izquierdo y derecho. Localizar después el ángulo B entre los ángulos A y C; por ej., el punto en el que las salidas L-CH y R-CH estén equilibradas. (Consultar las Fig. 3 y 4)
4. En el modo de reproducción en retroceso, ajustar el tornillo del azimut (en retroceso) del mismo mode que se ha descrito antes.

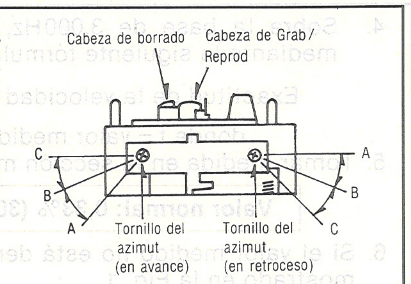

Cabeza de borrado
Cabeza de Grab/Reprod
C
A
B
B
A
C
Tornillo del azimut (en avance)
Tornillo del azimut (en retroceso)

Fig. 3

Ajuste de fase de L-CH/R-CH

5. Efectuar las conexiones como muestra la Fig. 5.
6. En el modo de reproducción en avance, reproducir la señal de 8kHz desde la cinta de prueba (QZZCFM). Ajustar el tornillo del azimut (en avance) mostrado en la Fig. 3 de forma que las agujas de los dos EVM oscilen hasta el máximo y una forma de onda de Lissajoues, tal como la ilustrada en la Fig. 6, se obtenga en el osciloscopio.
7. En el modo de reproducción en retroceso, ajustar el tornillo del azimut (en retroceso) del mismo mode que se ha descrito antes.

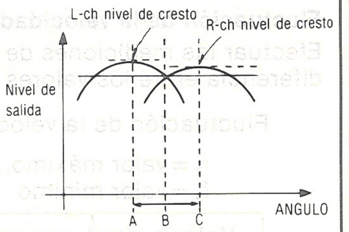


Fig. 4

Verificación de la diferencia de nivel entre el recorrido en avance y en retroceso

8. Reproducir la señal de ajuste del nivel de reproducción (315Hz a 0dB) en la cinta de ajuste de reproducción normal, y comprobar que la diferencia entre el nivel del recorrido en avance y del recorrido en retroceso está dentro de los 1,0dB.
9. Después del ajuste, bloquear los tornillos de ajuste del ángulo y de la altura de la cabeza de borrado.

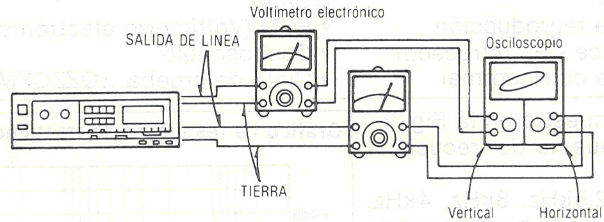


Fig. 5

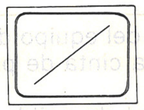
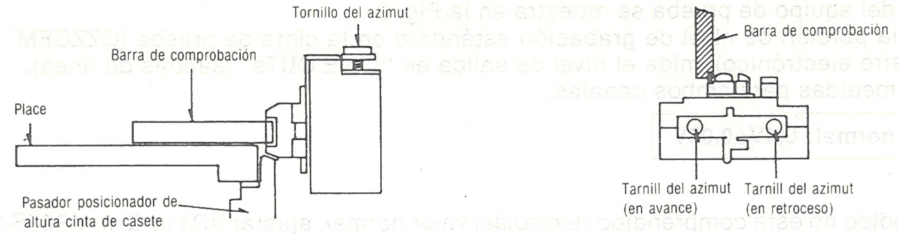


Fig. 6

Ajuste de la altura de la cabeza usando el posicionador de ajuste de la cabeza (QZZ0207)

El posicionador de ajuste de la cabeza (QZZ0207) hace posible un ajuste rápido y preciso de la altura de la cabeza de la forma siguiente:

a. Colocar la placa sobre el mecanismo.
b. Colocar el mecanismo en el modo PLAY (reproducción).
c. Colocar la barra de prueba sobre la placa.
d. Pasar la barra de prueba a través de cada cabeza de borrado.
e. Ajustar el tornillo de la altura de forma que la barra de prueba no toque ninguna de las cabeza de borrado.
f. Reproducir la cinta con espejo (QZZCRD) y comprobar viéndolo que la cinta no toca (ni da la vuelta, etc.) las cabezas de borrado.
g. Después, ajustar los puntos 1 a 7 del procedimiento de ajuste.


Tornillo del azimut
Barra de comprobación
Place
Pasador posicionador de altura cinta de casete
Barra de comprobación
Tarnill del azimut (en avance)
Tarnill del azimut (en retroceso)

Ⓑ Velocidad de la cinta

Condición:
- Modo de reproducción
- Modo de cinta normal

Equipo:
- Contador digital electrónico
- Cinta de prueba...QZZCWAT

Exactitud de la velocidad de cinta

1. La conexión del equipo de prueba se muestra en Fig. 7.
2. Reproducir la cinta de prueba (QZZCWAT 3.000Hz), y suministrar una señal de reproducción al contador digital electrónico.
3. Medir esta frecuencia.
4. Sobre la base de 3.000Hz, determinar el valor de la exactitud mediante la siguiente fórmula:

$$\text{Exactitud de la velocidad de cinta} = \frac{f-3.000}{3.000} \times 100(\%)$$

donde f = valor medido

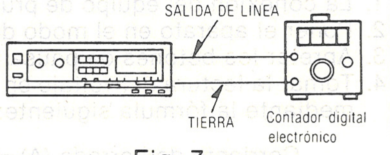


Fig. 7

4. Sobre la base de 3.000 Hz, determinar el valor de la exactitud mediante la siguiente fórmula:

$$\text{Exactitud de la velocidad de cinta} = \frac{f-3.000}{3.000} \times 100(\%)$$

donde f = valor medido

5. Tomar medida en la sección media de la cinta.

Valor normal: 0,33% (3000±10 Hz)

6. Si el valor medido no está dentro del valor estándar, ajustarlo usando el ajuste de velocidad de cinta VR mostrado en la Fig. 1.

Nota: No utilizar destornilladores metálicos cuando ajuste la precisión de la velocidad de la cinta en este aparato.

Fluctuación de la velocidad de cinta

Efectuar las mediciones de la misma manera que antes (al comienzo, mitad y final de la cinta) y determinar la diferencia entre los valores máximo y minimo. Calcular de la forma siguiente:

$$\text{Fluctuación de la velocidad de cinta} = \frac{f_1-f_2}{3.000} \times 100(\%)$$

f_1 = valor máximo,
f_2 = valor mínimo

Valor normal: menos de 1,5%

© **Respuesta de frecuencia de reproducción**

Condición:
- Modo de reproducción (En avance • En retroceco)
- Modo de cinta normal

Equipo:
- EVM (Voltímetro electrónico)
- Osciloscopio
- Cinta de prueba...QZZCFM

1. La conexión del equipo de prueba se muestra en la Fig. 2.
2. Reproducir la cinta de prueba de respuesta de frecuencia (QZZCFM).
3. Medir el nivel de salida en 315 Hz, 12,5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz y 63 Hz y comparar cada nivel de salida con 315 Hz de frecuencia normal, en LINE OUT.
4. Efectuar las medidas para ambos canales.
5. Asegurarse de que el valor medido está comprendido dentro de la gama especificada en el gráfico de la respuesta de frecuencia (mostrado en la Fig. 8).

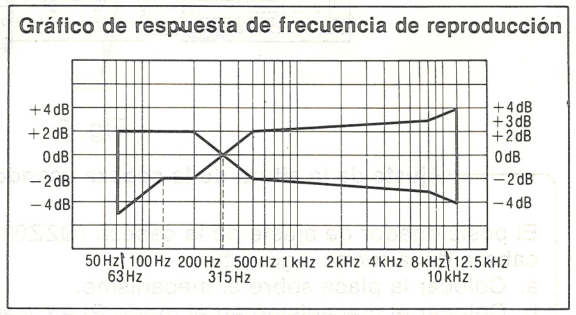


Fig. 8

Ⓓ **Ganancia de reproducción**

Condición:
- Modo de reproducción (En avance • En retroceco)
- Modo de cinta normal

Equipo:
- EVM (Voltímetro electrónico)
- Osciloscopio
- Cinta de prueba...QZZCFM

1. La conexión del equipo de prueba se muestra en la Fig. 2.
2. Reproduzca la porción de nivel de grabación estándard en la cinta de prueba (QZZCFM 315 Hz) y, usando EVM (voltímetro electrónico), mida el nivel de salida en "LINE OUTs" (salidas de línea).
3. Efectuar las medidas para ambos canales.

Valor normal: 0,4V±0,05V

Ajuste

1. Si el valor medido no está comprendido dentro del valor normal, ajustar VR1 (L-CH), VR2 (R-CH).
2. Despues del ajuste, comprobar de nuevo la "respuesta de frecuencia de reproducción".

Ⓔ **Corriente de borrado**

Condición:
- Modo de grabación (En avance • En retroceco)
- Modo de cinta metal

Equipo:
- EVM (Voltímetro electrónico)
- Osciloscopio

1. La conexión del equipo de prueba se muestra en la Fig. 9.
2. Poner el aparato en el modo de cinta Metal.
3. Apretar los botones de pausa y grabación.
4. Tomar la lectura del voltaje en EVM y calcular la corriente de borrado mediante la fórmula siguiente:

$$\text{Corriente de borrado (A)} = \frac{\text{Voltaje entre terminales de R201}}{1\ (\Omega)}$$

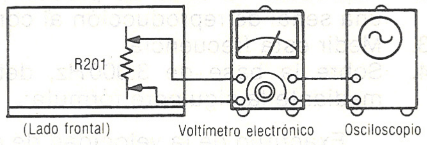


Fig. 9

Valor normal: 190 $^{+10}_{-15}$ mA (Modo de cinta...Metal) (190$^{+10}_{-15}$ mV)

5. Si el valor medido no está comprendido dentro del valor normal, ajustar de la forma siguiente:

Ajuste

- Si la corriente de borrado es mayor que 200mA cortar el hilo del puente.

Ⓕ **Respuesta de frecuencia total**

Condición:
- Modo de reproducción/grabación
- Modo de cinta normal
- Modo de cinta CrO_2
- Modo de cinta Metal
- Control de nivel de entrada ...MAX

Equipo:
- EVM (Voltímetro electrónico)
- ATT
- Oscilador de AF
- Osciloscopio
- Resistor (600Ω)
- Cinta de prueba (cinta en blanco de referencia)
  ...QZZCRA para Normal
  ...QZZCRX para CrO_2
  ...QZZCRZ para Metal

Nota:

Antes de medir y ajustar la respuesta de frecuencia total, asegurarse de la respuesta de frecuencia de reproducción. (Para el método de medida, sírvase consultar la respuesta de frecuencia de reproducción).
(Se fija el compensador de grabación.)

1. Efectuar las conexiones tal como se muestra en la Fig. 11.
2. Poner la UNIDAD en el modo de cinta normal y cargar la cinta de prueba (QZZCRA).
3. Aplicar una señal de 1 kHz desde el oscilador de AF a través de ATT a LINE IN.
4. Ajustar el ATT de forma que el nivel de entrada sea de −20dB por debajo del nivel estándar de grabación (nivel estándar de grabación = 0VU).
5. Ajustar el oscilador de AF para generar señales de 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz y 12,5 kHz y grabar, estas señales en la cinta de prueba.
6. Reproducir las señales grabadas en el paso 6, y comprobar si la curva de respuesta de frecuencia está dentro de los límites mostrados en el gráfico de respuesta de frecuencia total para las cintas normales (Fig. 10).
   (Si la curva está dentro de las especificaciones del gráfico, sequir con los pasos 7, 8 y 9).
   Si la curva no está dentro de las especificaciones del gráfico, ajustar de la forma siguiente:

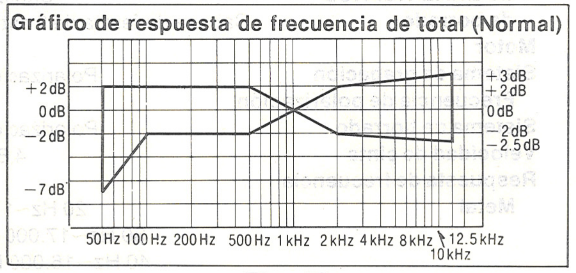


Fig. 10

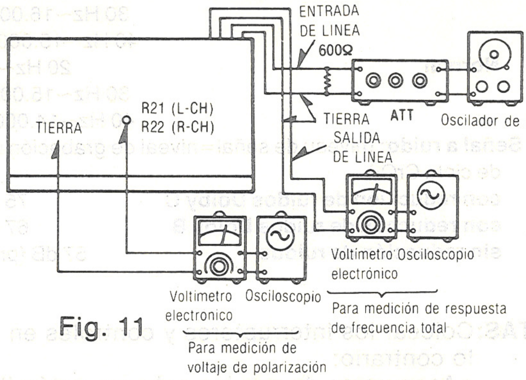


Fig. 11

Ajuste A:

Cuando la curva excede las especificaciones del gráfico de respuesta de frecuencia total (Fig. 10) tal como se muestra en la Fig. 12.

1) Aumentar la corriente de polarización girando VR201 (L-CH) y, VR202 (R-CH).
2) Repetir los pasos 5 y 6 para confirmación. (Seguir con los pasos 7, 8 y 9 si la curva está ahora dentro de las especificaciones del gráfico de la Fig. 10).
3) Si la curva todavía excede las especificaciones (Fig. 10), aumentar aún más la corriente de polarización y repetir los pasos 5 y 6.

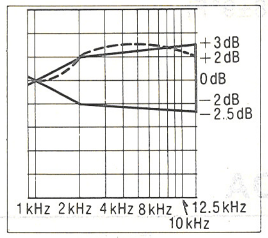


Fig. 12

Ajuste B:

Cuando la curva está por debajo de las especificaciones del gráfico de respuesta de frecuencia total (Fig. 10) tal como se muestra en la Fig. 13.

1) Reducir la corriente de polarización girando VR201 (L-CH) y, VR202 (R-CH).
2) Repetir los pasos 5 y 6 para confirmación. (Seguir con los pasos 7, 8 y 9 si la curva está ahora dentro de las especificaciones del gráfico de la Fig. 10.)
3) Si la curva todavía cae por debajo de las especificaciones del gráfico (Fig. 10), reducir aún más la corriente de polarización y repetir los pasos 5 y 6.

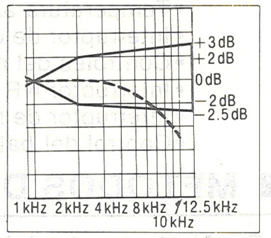


Fig. 13

7. Poner la UNIDAD en el modo de cinta CrO_2.
8. Cambiar la cinta de prueba a QZZCRX y grabar señales de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz y 14kHz. Luego, reproducir las señales y comprobar si la curva está dentro de los límites mostrados en el gráfico de respuesta de frecuencia total para las cintas CrO_2 (Fig. 14).
9. Poner la UNIDAD en modo de cinta a Metal y cambiar la cinta de prueba a QZZCRZ, y grabar señales de 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12,5kHz y 14kHz. Luego, reproducir las señales y comprobar si la curva está dentro de los limites mostrados en el gráfico de respuesta de frecuencia total para las cintas de Metal (Fig. 14).

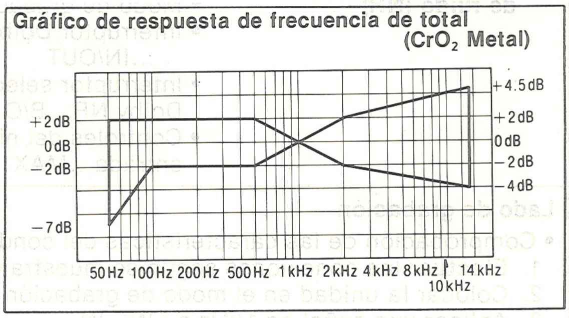


Fig. 14

10. Asegurarse de que las tensión de polarización sean aproximadamente las que se indican a continuación cuando el aparato esté colocado en un modo de cinta distinto.
   - Lea el voltaje en los terminales del resistor R21 (L-CH) [R22 (R-CH)] y calcule la corriente de polarización de la fòrmula siguiente.

$$\text{Corriente de polarización (A)} = \frac{\text{Valor leído en el EVM (V)}}{10\ (\Omega)}$$

Valor de referencia: Unos 420μA (posición Normal)
Unos 560μA (posición CrO_2)
Unos 900μA (posición Metal)

Ⓖ Ganancia total

Condición:
- Modo de reproducción/grabación
- Modo de cinta Normal
- Controles del nivel de entrada ...MAX.
- Nivel de entrada normal:

MIC ....-72^{+5}_{-3}dB (0,25mV)
LINE IN ....−24±4dB (60mV)

Equipo:
- EVM (Voltímetro electrónico)
- Oscilador de AF
- ATT
- Osciloscopio
- Resistor (600Ω)
- Cinta de prueba (cinta en blanco de referencia) ...QZZCRA para Normal

1. La conexión del equipo de prueba se muestra en la Fig. 15.
2. Cargar la cinta normal en blanco de referencia (QZZCRA).
3. Poner el aparato en el modo grabación.
4. Suministrar una señal 1kHz (−24dB) desde el oscilador de AF a través de ATT a LINE IN (ENTRADA DE LINEA).
5. Ajuster ATT hasta que el nivel del monitor en "LINE OUTs" sea 0,4±0,05V.
6. Reproduzca la cinta grabada y asegúrese de que el nivel de salida en "LINE OUTs" sea 0,4±0,05V.
7. Si el valor medido no es de 0,4±0,05V, ajustarlo con VR7 (L-CH), VR8 (R-CH).
8. Repetir desde el punto (2).

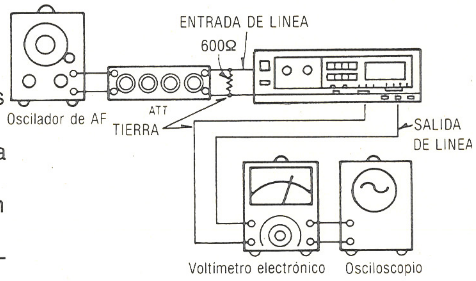


Fig. 15

Ⓗ Medidor de nivel

Condición:
- Modo de grabación
- Controles del nivel de entrada ...MAX

Equipo:
- EVM (Voltímetro electrónico)
- ATT
- Oscilador de AF
- Osciloscopio
- Resistor (600Ω)

1. Efectuar las conexiones segun se muestra en la Fig. 15.
2. Colocar la unidad en el modo de grabación.
3. Suministrar una señal de 1kHz (−24dB) desde el oscilador de AF a través del ATT a la ENTRADA DE LINEA (LINE IN).
4. Ajustar el ATT hasta que el nivel del monitor en la SALIDA DE LINEA (LINE OUT) llegue a ser 0,4V.
5. Comprobar que el medidor de nivel por LED "0" está encendido cuando la salida de 0,4V±1dB (0,05V) aparezca en la SALIDA DE LINEA.

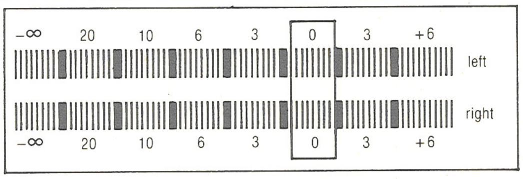


Fig. 16

● **Circuito Dolby de de ruido (NR)**

Condición:
- Modo de grabación
- Interruptor Dolby NR ...IN/OUT
- Interruptor selector del Dolby NR...B/C
- Controles del nivel de entrada...MAX

Equipo:
- EVM (Voltímetro electrónico)
- ATT
- Resistor (600Ω)
- Oscilador de AF
- Osciloscopio

Lado de grabación

- Comprobación de las caracteristicas del condificador tipo Dolby B.

1. Efectuar las conexiones segun se muestra en la Fig. 18.
2. Colocar la unidad en el modo de grabación (el interruptor selector NR está en OUT).
3. Aplicar una señal de 1kHz a LINE IN.
4. Ajustar el ATT de forma que el nivel de salida en el terminal 7 del IC3 (L-CH) e IC4 (R-CH) sea de 12,3mV.
5. El nivel de salida en el terminal 21 deberá ser de 0dB (375mV).
6. Colocar el interruptor selector NR en B, y asegurarse de que el nivel de la señal de salida en el terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +6dB±2dB (760mV).
7. Colocar el interruptor NR en OUT y ajustar la frecuencia a 5kHz. El nivel de la señal de salida en el terminal 21 deberá ser de 0dB (375mV).
8. Colocar el interruptor selector NR en B y asegurarse de que el nivel de la señal de salida en el terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +8dB±2dB (960mV).

- Comprobación de las características del codificador tipo Dolby C.

9. Repetir los pasos 1 a 5 anteriores.
10. Colocar el interruptor selector NR en C y asegurarse de que el nivel de la señal de salida en el terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +11,5dB±2dB (1,5V).
11. Colocar el interruptor selector NR en la posición OUT y ajustar la frecuencia a 5kHz. La señal de salida en el terminal 21 deberá ser de 0dB (375mV).
12. Colocar el interruptor selector NR en C, y asegurarse de que el nivel de la señal de salida del terminal 21 del IC3 (L-CH) e IC4 (R-CH) sea de +8,5dB±2dB (980mV).

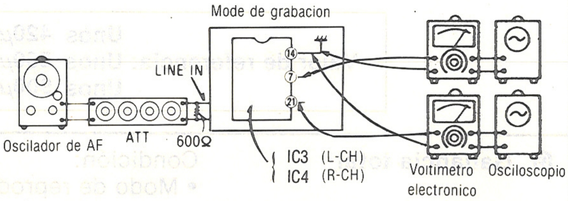


Fig. 18

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ORDER NO. HAD8506160P8

Parts Change Notice

Model No. RS-B28R (E/EK/EGA/EH/XA/XL)
RS-B49R (E/EK/EGA/EH/XA/XL)

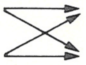
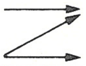
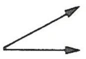
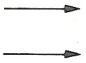
Service Manual
Order No. HAD85052539C0
HAD85052538C0

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the bottom column.

1. Improve performance
2. Change of material or dimension
3. To meel approved specification
4. Standardization
5. Addition
6. Deletion
7. Correction
8. Other

Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts		Set Production	
A	Original New		Early Late	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original New		Early Late	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
C	Original New		Early Late	New parts only may be used in early or late production sets. Stock new parts.
D	Original New		Early Late	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Other			

Part Number

Model No.	Ref. No.	Original Part No.	New Part No.	Notes (*'**)	Part Name & Descriptions	
RS-B28R	Q903 904	2SB1030R	2SB1030Q	7, C	Transistor	
	3–1	SKA1094	SKL294	7, C	Case Foot	
	46	STN16	SJN16	7, C	Tape Counter	
	133	RDGG003Z	RDGG0003Z	7, C	Reel Table Gear Ass'y	
RS-B49R	Q903 904	2SB1030R	2SB1030Q	7, C	Transistor	
	3–1	QKA1094	SKL294	7, C	Case Foot	
	133	RDGG003Z	RDGG0003Z	7, C	Reel Table Gear Ass'y	
	153	RVLL–101M2	RVLTP–101H2	7, C	Phote Sensor	
	C903	RCBS1H121K	RCBS1H121KBY	7, C	Capacitor	

File this Parts Change Notice with your copy of the Service Manual.

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850600880 ® MS